

GRAND QUIZ OF MTH202
SPRING 2021
265 MCQS
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1. $X = a, X = 3, x = 5a$ -----

Arithmetic sequence

2. composition of a function is commutative operation

False

3. real valued function is a function that assign ----- to each number of its domain

real number

4. let X equal 1 2 3 4 and a function f depend on X by
 f into 1 equal 1
 f into 2 equals to 2
 f into 3 equal 3 and
 F into 4 equal 4
Then-----

F is an identity function

5. a constant function is Injective if and only if-----

the codomain consists of a single element

6. let f ratio $R \rightarrow R$ is one to one function then c, f, c does not equal to zero is also, one to one function

True

7. if f and G are two one to one function then their composition that is $g \circ f$ is one to one

True

8. let f into $x = 3x$ and $g(X)$ equal $x + 2$ define function f and G from R to R then $f \circ g(X)$ is-----

$3x^2 + 6x$

9. the set Z of all integers is countable

True

10. 0.81 8181 is an infinite geometric series

True

11. which of the following is not correct for a sequence?

A sequence is a relation whose domain is the set of natural numbers

12. $f(x) = x^2$ is not one to one function from $\mathbb{R}$ to $\mathbb{R}$

true

13. let $f: \mathbb{R} \rightarrow \mathbb{R}$ defined by $f(x) = x + 2$ then $f^{-1}: \mathbb{R} \rightarrow \mathbb{R}$ is

$x - 2$

14. let $f: \mathbb{R} \rightarrow \mathbb{R}$ defined by $f(x) = x^2 + 1$ define function f^{-1} from $\mathbb{R}$ to $\mathbb{R}$ and $C = 2$ to be any scalar then $c, f(x)$ is-----

$2x^2 + 2$

15. one to one correspondence means the condition of

both a and c

16. Term of a geometric sequence is 2 and common ratio is $\frac{1}{2}$ then third term of a sequence is

$\frac{1}{2}$

17. the process of defining an object in terms of smaller version of itself is called recursion

True

18. a set is called countable if and only if it is

(d) (b) (c)

19. A sequence whose terms alternate in sign is called an----

alternating sequence

20. let f and G be two functions Defined by $f(x) = x + 2$ and $G(x) = x + 1$ then the composition of f and G is-----

$2x + 3$

21. number of one-to-one functions from $X = \{a, b\}$ to $Y = \{u, v\}$ are equal to-----

2

22. an important data type in computer programming consists of -----

finite sequence

23. if a function is recursively defined as $F(0) = 4$ & $f(n + 1) = 3f(n)$ then $f(1) =$ -----

15

24. inverse of a function may not be a function

True

25. if a function is recursively defined as $F(0) = -1$ & $f(n + 1) = f(n) + 3$, then

$f(1) =$ -----

2

26. The function f and G are inverse of each other if and only if their composition gives-----

identity function

27. which of the following state is a domain of a sequence -----

set of natural number

28. Let f and g be two functions defined by $f(x) = x + 2$ and $g(x) = 2x + 1$. Then the composition of f and g

$2x + 5$

29. Let $R = \{(1,2), (3,4), (5,6), (7,8)\}$. Range of the inverse of the relation is -

$\{1,3,5,7\}$

30. The set Z of all integers is countable.

True

31. In the representation of an irreflexive relation using a matrix, all its diagonal entries will be -----

0

32. Let $p = I$ am hard working. $Q = I$ am intelligent. Then $p \wedge q$ means -----

I am NOT hard working BUT I am intelligent.

33. If a set A contain n element n elements then the number of elements in its power set P(A) is-----

$$\underline{\underline{2^n}}$$

34. Which of the following is true for the following sequence? $C_n = 1 - (-1)^n$ for all integers $n > 0$

If n is even, then $C_n = 0$ and if n odd, then $C_n = 2$

35. Let $A = \{1, 2, 3, 4\}$ and $R = \{(1, 1) (2, 2) (3, 3) (4, 4)\}$ then R is

Options a, b and c all true

36. If $A - B = A$, which of the following statement is true?

All of the given statements are false

37. If $A = \{1, 2, 3\}$ is a set and $R = \{(1, 2) (2, 2) (2, 1)\}$ is a relation on A. R is

Symmetric

38. The converse of the conditional statement 'IF I live in Lahore, then I live in Punjab' is -----

If I live in Punjab, then I live in Lahore

39. Every set can be represented in tabular form.

False

40. The function defined from $\mathbb{Z}$ to $\mathbb{Z}$ as $f(x) = 1 / (x + 2)(x - 2)$ is not well defined because-----

Function is not defined at $x = -2$ and $x = 2$

41. Which of the following is always true for the matrix representation of a symmetric relation?

Matrix is equal to its transpose

42. Associative law of union for three sets is-----

$A \cup (B \cup C) = (A \cup B) \cup C$

43. If f is bijective function then $(f^{-1}(f(x)))$ is equal to -----

x

44. $P \leftrightarrow Q$ is logically equivalent to -----

$(p \rightarrow q)$

45. Let $A = \{0, 1, 2\}$ and $R = \{(0, 2), (1, 1), (2, 0)\}$ be a relation on A . Then which of the following ordered pairs are needed to make it reflexive.

$(0, 0)$ and $(2, 2)$

46. Let A be subset of universal set U then $A \cup A^c =$

Φ

47. Let R be a binary relation on a set A . if R is anti-symmetric then -----

Inverse of R is anti-symmetric

48. The inverse of statement 'if it is pleasant outside, then I go to the park' is -----

If it is NOT pleasant outside, then I do NOT go to the park.

49. The inverse of the statement 'if it is hot day, then I am at home' is -----

if it is NOT hot day, then I am NOT at home

50. Let A, B, C be subset of universal set U then the idempotent law is -----

$A \cap A = A$

51. Let A and B be subset of universal set U then $A - (A - B) =$

$A \cap B$

52. Real valued function is a function that assigns ----- to each member of its domain.

Only a real number

53. Let R be a relation on set A, if R is reflexive then its complement is -----

Irreflexive

54. Range of function $f(x) = \{e^x\}$ is -----

Set of positive Real numbers

55. Composite relation symbolically written as -----

$S \circ R = \{(a,c) | a \in A, c \in C, \exists b \in B, (a,b) \in R \text{ and } (b,c) \in S\}$

56. If $x \equiv 17 \pmod{5}$ which of the following integers are valid solution for x?

12

57. Operation of subtraction is a binary operation on the set of -----

Integers

58. Range of relation $\{(0, 10), (3, 22), (90, 34)\}$ is -----

$\{1, 22, 34\}$

59. Let $S = R$ and the “square” relation $R = \{(x, y) | x^2 = y^2\}$. The square relation is an ----- relation.

Equivalence relation

60. The logic gate NOT is a uniary operation on $\{0, 1\}$

True

61. Let $A = \{1, 2\}$, then $P(A) = \text{-----}$

$\{\{\}, \{1\}, \{2\}, \{1, 2\}\}$

62. If a relation R is reflexive, anti symmetric and transitive then which of the following is not true for the inverse relation.

Inverse relation will be irreflexive.

63. Let R be a binary relation on a set A . R is anti-symmetric iff -----

$a, b \in A$ if $(a, b) \in R$ and $(b, a) \in R$ then $a = b$

64. the inverse relation R^{-1} from B to A is defined as -----

$R^{-1} = \{(b, a) \in B \times A \mid (a, b) \in R\}$

65. Which of the following is true for the matrix representation of a symmetric relation?

Matrix is equal to its transpose

66.If $x = -10 \pmod{15}$ which of the following integers are valid solution for x ?

5

67.Let $A = \{0, 1\}$ and $B = \{1\}$. Let R and S be two binary relation on cartesian product of A and B such that $R = \{(0, 1)\}$ and $S = \{(1, 1)\}$

Then R intersection $S = \text{-----}$

Empty

68.The domain of a relation R from A to B is symbolically written as:

$D(R) = \{a \text{ belongs to } A \text{ such } (a, b) \text{ belongs to } R\}$

69.Which of the following is not a type of a relation?

Permutation

70.Let $A = \{4,5,6\}$ then the relation $R = \{(4, 5) . (5, 4). (6, 5) . (5, 6)\}$ is -----

R is symmetric

71.Let $A = \{1,2,3\}$ and $B = \{0,1,2\}$ and $C = \{a,b\}$

$R = \{(1,0) (1,2) (3,1) (3,2)\}$

$S = \{(0,b) (1,a), (2,b)\}$

Composite of R and $S = \text{-----}$

$\{(1,b) (3,a) (3,b)\}$

72.If A contain 3 elements and B contain 2 elements, then number of subsets of $A * B$ are -----

64

73.Let $A = \{1,2,3,4\}$ and define the following relations on A then $R = \{(1,3) (1,4) (2,3) (2,4) (3,1) (3,4)\}$ is -----

R is irreflexive

74.Let $X = \{2,4,5\}$ and $Y = \{1,2,3\}$ and R be a relation from X to Y defined by $R = \{(2,4) (4,1) (a,2)\}$. for what value of 'a' the relation R is a function?

5

75.A function whose range consists of only one element is called_____

One to one function

76.The set Z of all integers is _____

Countable

77.One-to-one correspondence means the condition of _____

Both (a) and (c)

78.Let $X=\{1,5,9\}$ and $Y=\{3,4,7\}$, Define a function f from X to Y such that $f(1)=7, f(5)=3, f(9)=$ _____. Which is true f(9) to make it a one-to-one (injective) function?

4

79. What will be the fourth term of the following sequence $1/2, 2/3, 3/4$ _____?

$4/5$

80. The value of $6!$ =

720

81. A constant function is one to one iff its _____ is a singleton.

Domain

82. A constant function is onto iff its _____ is a singleton. Co-domain

Number of one to one functions from $X = \{a, b\}$ to $Y = \{u, v\}$ are equal to _____ -

2

83. If f is defined recursively by $f(0) = -1$ and $f(n+1) = f(n) + 3$, then $f(2) =$ _____.

5

84. A function whose inverse function exists is called a/an _____

Invertible function

85. Let $f(2) = 3$, $g(2) = 3$, $f(4) = 1$ and $g(4) = 2$ then the value of $f \circ g(4)$ is.....

3

86. Let $A = \{1, 2, 3, 4\}$ and $B = \{7\}$ then the constant function from A to B is _____.

Onto

87. Composition of a function is a commutative operation.

False

88. Composition of a function is not a commutative operation

True

89. The sum of first five whole number is _____.

10

90. If f and g are two one-to-one functions, then their composition that is $g \circ f$ is one-to-one.

True

91. Inverse of a surjective function is always a function.

False

92. Inverse of a surjective function may not be a function

True

93. Let $X = \{1, 2, 3, 4\}$ and $Y = \{7, 8, 9\}$ and let f be function defined from X to Y such that f is onto then which of the following statement about f is true?

Co-domain of f must contain 3 elements

94.If $f: X \rightarrow Y$ and $g: Y \rightarrow Z$ are both onto functions. Then $g \circ f: X \rightarrow Z$ is

onto

95.If f and g are two one-to-one functions, then their composition $g \circ f$ is _____

One-to-one

96.If $f: W \rightarrow X$, $g: X \rightarrow Y$, and $h: Y \rightarrow Z$ are functions, then _____
($h \circ g$) $\circ f = h \circ (g \circ f)$

97.Cardinality of positive prime numbers less than 20 is _____.
8

98. IF $f(x) = \sin^{-1}(x)$ and $g(x) = \sin x$ then $g \circ f(x)$ is _____.
X

99. $0! =$ _____.
1

100. An important data type in computer programming consists of _____.
Finite sequences

101. Let $f(x) = 2x$ and $g(x) = x + 2$ define functions f and g from R to R , then $(f \circ g)(x)$ is _____.
_____.

$x-2$

102. The total number of terms in an arithmetic series $0+5+10+15+\dots+50$ are _____.

11

103. $9!/6!=$ _____

504

104. Let $f(x)=3x$ and $g(x)=3x-2$ define functions f and g from R to R , THEN $(F+G)(X)$ is

$6x-2$

105. If f is a bijective function then $(f^{-1}f(x))$ is equal to

x

106. A sequence whose terms alternate in sign is called an_____

Alternating sequence

107. Common ratio in the sequence “4, 16, 64, 256,...” is.....12.

4

108. 0.8181818181 is a infinite geometric series.

True

109. The word 'algorithm' refers to a step-by-step method for performing some action.

True

110. A predicate become _____ when its variables are given specific values

Sentence

111. The sum of two irrational numbers must be an irrational number.

False

112. The sum of two irrational numbers need not be irrational number

True

113. The division by zero is allowed in mathematics.

False

114. The product of any two consecutive positive integers is divisible by 2

True

115. If 'n' is an odd integer then n^3+n is _____.

Even

116. For integers a,b,c, If divides b and a divides c, then a divides (a+b).

False

- 117. Quotient remainder theorem states that for any positive integer d , there exist unique integer q and r such that _____ and $0 < r < d$**

$N = d \cdot q + r$

- 118. A rule that assigns a numerical value to each outcome in a sample space is called**

Random variable

- 119. If A and B are two disjoint (mutually exclusive) events then $P(A \cap B) =$**

$P(A) + P(B)$

- 120. How many ways are there to select five players from a 10 member tennis team to make a trip to a match to another school?**

$C(10, 5)$

The expectation of x is equal to

$\sum x f(x)$

- 121. If $P(A \cap B) = P(A) P(B)$ THEN THE events A and B are called**

Independent

- 122. A walk that starts and ends at the same vertex is called.**

None optins

123. How many integers from 1 through 1000 are neither multiple of 3 nor multiple of 5

497

124. What is the probability of getting a number greater than 4 when a die is thrown?

3/5

125. Eater formula for graphs is _____.

$F = e - v + 2$

126. $X + a, x + 3a, x + 5a, \dots$ is an _____

Arithmetic sequence

127. Composition of a function is a commutative operation.

False

128. Real valued function is a function that assigns _____ to each member of its domain.

Only a real number

129. Let $X = \{1, 2, 3, 4\}$ and a function 'f' defined on X
 $f(1) = 1, f(2) = 2, f(3) = 3, f(4) = 4$ then _____

F is an identity function

130. A constant function is surjective if and only if _____

The co-domain consists of a single element

131. Cardinality means the total number of elements in a set.

True

132. If $f(x)=2x$ and $g(x)=x$ then $g(f(x))$ is _____.

$2x^2$

133. Let $f: \mathbb{R} \rightarrow \mathbb{R}$ is one to one function then c, f, c is not equal 0 is also one to one function.

True

134. Let $X=\{1,2,3,4\}$ and a function 'f' defined from X to X by $f(1)=1$, $f(2)=1$, $f(3)=1$, $f(4)=1$

then which of the following is true?

F is a constant function

135. If f and g are two one-to-one functions, then their composition that is $g \circ f$ is one-to-one.

True

136. Which of the following is not correct for a 'sequence'?

A sequence is a relation whose domain is the set of natural numbers

137. $F(x)=x^2$ is not one to one function from $\mathbb{R}$ to $\mathbb{R}^+$

True

- 138. Let $f: \mathbb{R} \rightarrow \mathbb{R}$ is one to one function then $c, f \circ c$ is not equal to is also one to one function.**

True

- 139. Let $f(x) = x + 2$ then $f^{-1}(x)$ is _____**

$x - 2$

- 140. Let $f(x) = x^2 + 1$ define functions f from $\mathbb{R}$ to $\mathbb{R}$ and $c = 2$ be any scalar, then $c, f(x)$ is _____.**

$2x^2$

- 141. One to one correspondence means the condition of _____.**

Both (a) and (c)

- 142. A function $F: \mathbb{R} \rightarrow \mathbb{R}$ defined by $f(x) = \text{square root } x$ is a real valued function.**

False

- 143. If $g: \mathbb{R} \rightarrow \mathbb{R}$ defined by $g(x) = e^x$ is a real valued function of a real variable.**

True

- 144. A function $F: \mathbb{R} \rightarrow \mathbb{R}$ defined by $f(x) = \log x$ is a real valued function**

True

145. $\frac{1}{2}$, then 3rd term of sequence is _____.

$\frac{1}{2}$

146. The process of defining an object in terms of smaller versions of itself is called

recursion.

True

147. Which of the following is not correct for a 'sequence'?

A sequence is a relation whose domain is the set of natural numbers

148. A set is called countable if, and only if, it is _____.

Finite and countable infinite.....

both

149. A set that is not countable is called _____.

Uncountable

150. A sequence whose terms alternate in sign is called an _____.

Alternating sequence

151. Let $f: R \rightarrow R$ is one to one function then c, f is also one to one function for _____.

C is not equal 0

152. Let $f(x) = x+3$ then $f^{-1}(x)$ is _____ -
x-3

**153. Let f and g be two functions defined by $f(x) = x+2$ and $g(x) = 2x+1$.
Then the
composition of f and g is_____.
2x+3**

**154. Number of one to one functions form $X=\{a,b\}$ to $Y=\{u,v\}$ are
equal to _____.
2**

**155. The fibonacci sequence is defined as $F_0=1, F_1=1, F_k=F_{k-1}+F_{k-2}$
for all integers $k > 2$ then which of the following is true for F_2
 $F_2-F_1 = 2-1=1$**

**156. $x+a, x+3a, x+5a, \dots$ is a/an_____.
Arithmetic sequence**

**157. Inverse of a function may not be a function.
True**

**158. In the following sequence $a_k = K/(k+1)$, for $k=1$, a_1 will be
_____.
 $\frac{1}{2}$**

159. If $f(x)=x$ and $g(x)= -x$ are both one to one function then $(f+g)(x)$ is also one to one function.

False

160. If $f(x)=x$ and $g(x)= -x$ are both one to one function then $(f+g)(x)$ is not one to one function.

True

161. The function 'f' and 'g' are inverse of each other if and only if their composition gives_____.

Identity function

162. Which of the following set is the domain of a sequence?

Set of real numbers

163. Let C is defined as the set of all countries in the world then C is a _____.

Finite set

164. A constant function is surjective if and only if_____.

The co domain consists of a single element

165. Inverse of a function may not be a function.

True

166. Let $X=\{1,2,3,4\}$ and a function 'f' defined from X to X by $f(1)=1$, $f(2)=1$, $f(3)=1$, $f(4)=1$ then which of the following is true?

F is a constant function

167. The composition of function is always
Associative

168. A set is countably infinite if, and only if, it has the same cardinality as the set of -----

Positive integers

169. Two functions 'f' and 'g' from 'X' to 'Y' are said to be equal if and only if _____.

$F(x)=g(x)$ for all 'x' belongs to X

170. $Y=x^3$ is a graph of bijective function from R to R.
True

171. Domain and range are same for_____.
Identity function

172. Let $X=\{1,2,3,4\}$ and a function 'f' defined on X by
 $f(1)=1, f(2)=2, f(3)=3$

F is an identity function

173. Composition of a function is a commutative operation.
True

174. Inverse of a surjective function is always a function.

False

175. A function whose inverse function exists is called a/an_____.

Invertible

176. Given a set X define a function I from X to X by $i(x)=x$ from all x belonging to X . Then_____.

I is both injective and surjective

177. Let $f: \mathbb{R} \rightarrow \mathbb{R}$ is a one to one function then c, f is also one to one function for.

C is not equal 0

178. Let $X=\{1,5,9\}$ and $Y=\{3,4,7\}$. Define a function f from X to Y such that

$f(1)=7, f(5)=3, f(9)=$ _____. Which is true for $f(9)$ to make it a one-to-one (injective) function?

4

179. Which of the following is not a predecessors of a_k ?

A_{k+1}

180. Two functions ' f ' and ' g ' from X to Y are said to be equal if and only if_____.

$F(x)=g(x)$ for all 'x' belongs to x

181. The two functions 'f' and 'g' are equal if _____.

$F(x)=3x$ and $g(x)=\frac{6x^2+3x}{2x^2+1}$ for all $x \in \mathbb{R}$

182. If first term of a geometric sequence is 2 and common ratio is $\frac{1}{2}$,
then-----
3rd ter, of sequence. $\frac{1}{4}$

183. $Y = \sqrt{x}$ is an _____ function from $\mathbb{R}^+$ to $\mathbb{R}$
One to one function

184. $Y = x^2$ is an _____ function from $\mathbb{R}$ to $\mathbb{R}^+$
NOT ONE TO ONE FUNCTION

185. If a function $(g \circ f)(x) : X \rightarrow Z$ is defined as $(g \circ f)(x) = g(f(x))$ for all
 $x \in X$, Then the
function_____.
(gof)

186. If 0 is the first term and -2 be the common difference of an
arithmetic series, then the sum of first five terms of series is _____.
-20

187. If $f(x) = \sin^{-1}(x)$ and $g(x) = \sin x$ then $g \circ f(x)$ is _____.
 x

188. $F: X \rightarrow Y$ that is both one to one and onto is called a _____.

Bijjective function

189. What does 'y' denotes in a geometric sequence?

Common ratio

190. Let g be a function defined by $g(x)=x+1$. Then the composition of $(g \circ g)$. X

$2+2x+1$

191. A graph of a function f is one to one iff every horizontal line intersects the graph in at most one point.

True

192. Which of the following is true for the following sequence?

If n is even, then $C_n=2$ and if n is odd,
then $C_n = 0$

193. The function 'f' and 'g' are inverse of each other if and only if their
composition gives _____.

Identity function

194. $N!$ is defined to be _____.

The product of the integers from 1 to n

195. Let $A = \{1,2,3,4\}$ and $B=\{7\}$ then the constant function from A to B

Both one to one and onto

196. A set is called countable if, and only if, it is _____.

Countably infinite and finite

197. If $f(x) = x$ and $g(x) = -x$ are both one to one functions then $(f+g)(x)$ is also one to one function.

False

198. If a is the 1st term and d be the common difference of an arithmetic sequence

then the sequence is $a, a+d, a+2d, a+3d, \dots$

True

199. $x+a, x+3a, x+5, \dots$ is a/an _____.

Arithmetic sequence

200. inverse of an injective function may not be a function.

True

201. $y=x^3$ is a graph of bijective function form R to R

False

202. Two functions 'f' and 'g' from x to y are said to be equal if and only if ____.

$f(x)=g(x)$ for all 'x' belongs to x

203. Common ratio in sequence '36, 12, 4, $\frac{4}{3}$, ...' is

$\frac{1}{3}$

204. A set is called finite if, and only if, is the _____ or there is -----
-.

Empty set or one-to-one

205. Let $f(x)=x^2-1$ and $g(x)=x+1$ define functions f and g from R to R, then $(f/g)x$

$x-1$

206. A graph of a function f is one to one iff every horizontal line intersects the

graph in at most one point.

True

207. Let g be a function defined by $g(x) = x+1$. Then the composition of (gog).

x^2+2x+1

208. $F:X \rightarrow Y$ that is both one to one and onto is called a _____.

Bijjective function

209. What does 'r' denotes in a geometric sequence?

Common ratio

210. Let $A=\{1,2,3,4\}$ and $B=\{7\}$ then the constant function from A to B is _____.

Both one to one and onto

211. $N!$ is defined to be _____.

The product of the integers from 1 to n

212. A set is called countable if, and only if, it is _____. Both b and c

213. Which of the following is the example of an alternating sequence?

$C_n = n/n+1$ for $n > 0$

214 $x+a, x+3a, x+5a, \dots$ is an _____

Arithmetic sequence

215 $0, -5, -10, -15, \dots$ is an _____.

Arithmetic sequence

225. $5, 9, 13, 17, \dots$ is an _____.

Arithmetic sequence

226. An important data type in computer programming consists of _____.

Finite sequence

227. One-to-one correspondence means the condition of _____.

One-one and onto both

228. Cardinality means the total number of elements in a set.

True

229. Inverse of a function may not be a function.

True

230. The functions 'f' and 'g' are inverse of each other if and only if their composition gives _____.

Identity function

231. A set is called finite if , and only if, it is the _____ or there is _____.

Empty set or one-to-one

232. Let f and g be the two functions from R to R defined by $f(x) = |x|$ and $g(x) = \text{square root } x^2$ for all $x \in R$, then _____.

F(x) is not equal to g(x)

234. If $f^{-1}(x) = 6 - x/2$ then $f^{-1}(2)$ is _____.

2

235. Let $f(2)=3$, $g(2)=3$, $f(4)=1$ and $g(4)=2$ then the value of $f \circ g(4)$ is _____.

3

236. An important data type in computer programming consists of _-----.

Finite sequence

237. Let $f(x)=x+3$ then f^{-1}

(x) is _____.

X-3

238. If $f: X \rightarrow Y$ and $g: Y \rightarrow Z$ are both onto function. Then $g \circ f : X \rightarrow Z$ is _____.

One-to-one function

239. The functions 'f' and 'g' are inverse of each other if and only if their composition gives

Identity function

240. The two function 'f' and 'g' are equal if _____.

$f(x) = 3x$ and $g(x) = 6x^2 + 3x/2x + 1$ for all $x \in \mathbb{R}$

241, Two functions 'f' and 'g' from X To Y are said to be equal if and only if--
-----.

$F(x)$ and $g(x)$ for all 'x' belongs to X

242 Which of the following set is the domain of a sequence?

Set of natural numbers

243 If 1st term of a geometric sequence is 2 and common ratio is $\frac{1}{2}$, then 3rd term of sequence is _____.

$\frac{1}{2}$

244 Composition of a function is a commutative operation.

True

245 If a function $(g \circ f)(x): X \rightarrow Z$ is defined as $(g \circ f)(x) = g(f(x))$ for all $x \in X$. Then the

function _____ is known as composition of f and g. ($g \circ f$)

246 A set is countably infinite if and only if, it has the same cardinality as the set of _____.

Positive integers

247 The 3rd term of the sequence $b_n = 5^n$ is _____.

125

248 If f is a bijective function then $(f^{-1})(f(x))$ is equal to _____.

X

249 Let $f(x) = x$ and $g(x) = -x$ for all $x \in \mathbb{R}$, then $(f+g)(x)$ is ____.

0

250 An infinite sequence may have only a finite number of values.

True

251 The functions $f \circ g$ and $g \circ f$ are always equal .

False

252 If f and g are two one-to-one functions, then their composition that is $g \circ f$ is

one-to-one.

True

253 A function whose range consists of only one element is called

_____.

Constant function

254 Let $X = \{1, 5, 9\}$ and $Y = \{3, 4, 7\}$. Define a function f from X to Y such that $f(1)=7$, $f(5)=3$, $f(9)=4$ then which of the following statement about 'f' is true?

F is both one-to-one and onto

255 $Y=x^3$ is a graph of bijective function from $\mathbb{R}$ to $\mathbb{R}$.

True

256 A function whose inverse function exists is called a/an_____.

Invertible

257 Let f and g be two functions defined by $f(x) = x+2$ and $g(x) = 2x+1$. Then the

composition of f and g is _____.

$2x + 5$

257 If r is a positive real number, then the value of r in $3, r, r = -27r$ is

None options

258 The _____ of the terms of a sequence forms a series.

Sum

259 The sum of first five whole number is _____.

10

260 If $f_k = f_{k-1} + f_{k-2}$ then $f_0 = 1, f_1 = 2$, then $f_2 =$ _____.

3

261 Range of function $\{f(x) = \{e^x\}\}$ is -----

Set of positive Real numbers

262 Composite relation symbolically written as -----

$SoR = \{(a,c) | a \in A, c \in C, \exists b \in B, (A,B) \in R \text{ and } (b,c) \in S\}$

263 If $x = 17 \pmod{5}$ which of the following integers are valid solution for x?

12

264 Operation of subtraction is a binary operation on the set of -----

Integers

265 Range of relation $\{(0, 10), (3, 22), (90, 34)\}$ is -----

$\{1, 22, 34\}$

QUIZ 2 SPRING 2021 181 MCQS

SEARCHING FILE MTH202

OWNER OF DAVID WORRIORS

1. A function whose range consists of only one element is called _____

One to one function

2. The set $\mathbb{Z}$ of all integers is _____

Countable

3. One-to-one correspondence means the condition of _____

Both (a) and (c)

4. Let $X=\{1,5,9\}$ and $Y=\{3,4,7\}$, Define a function f from X to Y such that $f(1)=7, f(5)=3, f(9)=$ _____. Which is true $f(9)$ to make it a one-to-one (injective) function?

4

5. What will be the fourth term of the following sequence $1/2, 2/3, 3/4$ _____?

4/5

6. The value of $6!=$

720

7. A constant function is one to one iff its _____ is a singleton.

Domain

8. A constant function is onto iff its _____ is a singleton.

Co-domain

9. Number of one to one functions from $X=\{a,b\}$ to $Y=\{u,v\}$ are equal to _____ -

2

10. If f is defined recursively by $f(0) = -1$ and $f(n+1)=f(n)+3$, then $f(2)=$ _____.

5

11. A function whose inverse function exists is called a/an_____

Invertible function

12. Let $f(2)=3$, $g(2)=3$, $f(4)=1$ and $g(4)=2$ then the value of $f \circ g(4)$ is.....

3

13. Let $A=\{1,2,3,4\}$ and $B=\{7\}$ then the constant function from A to B is _____.

Onto

14. Composition of a function is a commutative operation.

False

15. Composition of a function is not a commutative operation

True

16. The sum of first five whole number is _____.

10

17. If f and g are two one-to-one functions, then their composition that is $g \circ f$ is one-to-one.

True

18. Inverse of a surjective function is always a function.

False

19. Inverse of a surjective function may not be a function

True

20. Let $X=\{1,2,3,4\}$ and $Y=\{7,8,9\}$ and let f be function defined from X to Y such that f is onto then which of the following statement about f is true?

Co-domain of f must contain 3 elements

21. If $f: X \rightarrow Y$ and $g: Y \rightarrow Z$ are both onto functions. Then $g \circ f: X \rightarrow Z$ is _____

onto

22. If f and g are two one-to-one functions, then their composition $g \circ f$ is _____

One-to-one

23. If $f: W \rightarrow X$, $g: X \rightarrow Y$, and $h: Y \rightarrow Z$ are functions, then _____

$(h \circ g) \circ f = h \circ (g \circ f)$

24. Cardinality of positive prime numbers less than 20 is _____.

8

25. If $f(x)=\sin^{-1}(x)$ and $g(x)=\sin x$ then $g \circ f(x)$ is _____.

x

26. $0! =$ _____.

1

27. An important data type in computer programming consists of _____.

Finite sequences

28. Let $f(x)=2x$ and $g(x)=x+2$ define functions f and g from R to R , then $(f-g)(x)$ is _____.

$x-2$

29. The total number of terms in an arithmetic series $0+5+10+15+\dots+50$ are _____.

11

30. $9!/6! =$ _____

504

31. Let $f(x)=3x$ and $g(x)=3x-2$ define functions f and g from R to R , THEN $(F+G)(X)$ is

$6x-2$

32. If f is a bijective function then $(f^{-1}f(x))$ is equal to

x

33. A sequence whose terms alternate in sign is called an _____

Alternating sequence

34. Common ratio in the sequence "4, 16, 64, 256,..." is.....12.

4

35. 0.8181818181 is a infinite geometric series.

True

36. The word 'algorithm' refers to a step-by-step method for performing some action.

True

37. A predicate become _____ when its variables are given specific values

Sentence

38. The sum of two irrational numbers must be an irrational number.

False

39. The sum of two irrational numbers need not be irrational number

True

40. The division by zero is allowed in mathematics.

False

41. The product of any two consecutive positive integers is divisible by 2

True

42. If ' n ' is an odd integer then n^3+n is _____.

Even

43. For integers a, b, c , If d divides b and a divides c , then a divides $(a+b)$.

False

44. Quotient remainder theorem states that for any positive integer d , there exist unique integer q and r such that _____ and $0 < r < d$

$$N = d \cdot q + r$$

45. A rule that assigns a numerical value to each outcome in a sample space is called

Random variable

46. If A and B are two disjoint (mutually exclusive) events then $P(A \cap B) =$

$$P(A) + P(B)$$

47. How many ways are there to select five players from a 10 member tennis team to make a trip to a match to another school?

$$C(10, 5)$$

48. The expectation of x is equal to

$$\sum x f(x)$$

49. If $P(A \cap B) = P(A) P(B)$ THEN THE events A and B are called

Independent

50. A walk that starts and ends at the same vertex is called.

None of these

51. How many integers from 1 through 1000 are neither multiple of 3 nor multiple of 5

$$497$$

52. What is the probability of getting a number greater than 4 when a die is thrown?

3/5

53. Eater formula for graphs is_____.

$$F=e-v+2$$

54. $X+a, x+3a, x+5a, \dots$ is an_____

Arithmetic sequence

55. Composition of a function is a commutative operation.

False

56. Real valued function is a function that assigns _____ to each member of its domain.

Only a real number

57. Let $X=\{1,2,3,4\}$ and a function 'f' defined on X $f(1)=1, f(2)=2, f(3)=3, f(4)=4$ then _____

F is an identity function

58. A constant function is surjective if and only if _____

The co-domain consists of a single element

59. Cardinality means the total number of elements in a set.

True

60. If $f(x)=2x$ and $g(x)=x$ then $g(f(x))$ is _____.

$$2x^2$$

61. Let $f:R \rightarrow R$ is one to one function then c, f, c is not equal 0 is also one to one function.

True

62. Let $X=\{1,2,3,4\}$ and a function 'f' defined from X to X by $f(1)=1, f(2)=1, f(3)=1, f(4)=1$ then which of the following is true?

F is a constant function

63. If f and g are two one-to-one functions, then their composition that is gof is one-to-one.

True

64. Which of the following is not correct for a 'sequence'?

A sequence is a relation whose domain is the set of natural numbers

65. $F(x)=x^2$ is not one to one function from R to R^+

True

66. Let $f: R \rightarrow R$ is one to one function then $c, f \circ c$ is not equal to is also one to one function.

True

67. Let $f(x)=x+2$ then $f^{-1}(x)$ is _____

$x-2$

68. Let $f(x)=x^2+1$ define functions f from R to R and $c=2$ be any scalar, then $c, f(x)$ is _____.

$2x^2-1$

69. One to one correspondence means the condition of _____.

Both (a) and (c)

70. A function $F: R \rightarrow R$ defined by $f(x) = \text{square root } x$ is a real valued function.

False

71. If $g: R \rightarrow R$ defined by $g(x)=e^x$ is a real valued function of a real variable.

True

72. A function $F: R \rightarrow R$ defined by $f(x) = \log x$ is a real valued function

True

73. $\frac{1}{2}$, then 3rd term of sequence is _____.

$\frac{1}{2}$

74. The process of defining an object in terms of smaller versions of itself is called recursion.

True

75. Which of the following is not correct for a 'sequence'?

A sequence is a relation whose domain is the set of natural numbers

76. A set is called countable if, and only if, it is _____.

Finite and countable infinite.....both

77. A set that is not countable is called _____.

Uncountable

78. A sequence whose terms alternate in sign is called an _____.

Alternating sequence

79. Let $f: \mathbb{R} \rightarrow \mathbb{R}$ is one to one function then c, f is also one to one function for _____.

c is not equal 0

80. Let $f(x) = x+3$ then $f^{-1}(x)$ is _____ -

$x-3$

81. Let f and g be two functions defined by $f(x) = x+2$ and $g(x) = 2x+1$. Then the composition of f and g is _____.

$2x+3$

82. Number of one to one functions from $X=\{a,b\}$ to $Y=\{u,v\}$ are equal to _____

2

83. The fibonacci sequence is defined as $F_0=1, F_1=1, F_k=F_{k-1}+F_{k-2}$ for all integers $k \geq 2$ then which of the following is true for F_2

$F_2 - F_1 = 2+1=3$

84. $x+a, x+3a, x+5a, \dots$ is a /an _____.

Arithmetic sequence

85. Inverse of a function may not be a function.

True

86. In the following sequence $a_k = K/(k+1)$, for $k=1$, a_1 will be _____.

$\frac{1}{2}$

87. If $f(x)=x$ and $g(x)=-x$ are both one to one function then $(f+g)(x)$ is also one to one function.

False

88. If $f(x)=x$ and $g(x)= -x$ are both one to one function then $(f+g)(x)$ is not one to one function.

True

89. The function 'f' and 'g' are inverse of each other if and only if their composition gives_____.

Identity function

90. Which of the following set is the domain of a sequence?

Set of real numbers

91. Let C is defined as the set of all countries in the world then C is a _____.

Finite set

92. A constant function is surjective if and only if_____.

The co domain consists of a single element

93. The sum of the series $a_1 + a_2 + a_3 + \dots$ can be written as _____.

$$\sum_{i=1}^{\infty} a_k$$

94. Inverse of a function may not be a function.

True

95. If $F_k = F_{k-1} + F_{k-2}$ then $F_0 = 1, F_1 = 2$, then $F_2 =$ _____

3

96. Let $X=\{1,2,3,4\}$ and a function 'f' defined from X to X by $f(1)=1, f(2)=1, f(3)=1, f(4)=1$ then which of the following is true?

F is a constant function

97. The composition of function is always

Associative

98. A set is countably infinite if, and only if, it has the same cardinality as the set of

Positive integers

99. Two functions 'f' and 'g' from 'X' to 'Y' are said to be equal if and only if _____.

$f(x)=g(x)$ for all 'x' belongs to X

100. $Y=x^3$ is a graph of bijective function from R to R.

True

101. Domain and range are same for_____.

Identity function

102. Let $X=\{1,2,3,4\}$ and a function 'f' defined on X by $f(1)=1, f(2)=2, f(3)=3$

f is an identity function

103. Composition of a function is a commutative operation.

True

104. Inverse of a surjective function is always a function.

False

105. A function whose inverse function exists is called a/an_____.

Invertible

106. Given a set X define a function I from X to X by $i(x)=x$ from all x belonging to X. Then_____.

I is both injective and surjective

107. Let $f: R \rightarrow R$ is a one to one function then c, f is also one to one function for.

c is not equal 0

108. Let $X=\{1,5,9\}$ and $Y=\{3,4,7\}$. Define a function f from X to Y such that $f(1)=7, f(5)=3, f(9)=$ _____. Which is true for f(9) to make it a one-to-one (injective) function?

4

109. Which of the following is not a predecessors of ak?

$$A_{k+1}$$

110. Two functions 'f' and 'g' from X to Y are said to be equal if and only if _____.

$$F(x)=g(x) \text{ for all 'x' belongs to } X$$

111. The two functions 'f' and 'g' are equal if _____.

$$F(x) = 3x \text{ and } g(x) = 6x^2 + 3x/2x^2 + 1 \text{ for all } x \in \mathbb{R}$$

112. If first term of a geometric sequence is 2 and common ratio is $\frac{1}{2}$, then 3rd term, of sequence.

$$\frac{1}{4}$$

113. $Y = \sqrt{x}$ is an _____ function from $\mathbb{R}^+$ to $\mathbb{R}$

One to one function

114. $Y = x^2$ is an _____ function from $\mathbb{R}$ to $\mathbb{R}^+$

NOT ONE TO ONE FUNCTION

115. If a function $(g \circ f)(x) : X \rightarrow Z$ is defined as $(g \circ f)(x) = g(f(x))$ for all $x \in X$, Then the function _____.

(gof)

116. If 0 is the first term and -2 be the common difference of an arithmetic series, then the sum of first five terms of series is _____.

$$-20$$

117. If $f(x) = \sin^{-1}(x)$ and $g(x) = \sin x$ then $g \circ f(x)$ is _____.

X

118. $F: X \rightarrow Y$ that is both one to one and onto is called a _____.

Bijjective function

119. What does 'r' denotes in a geometric sequence?

Common ratio

120. Let g be a function defined by $g(x) = x+1$. Then the composition of (gog).

$$X^2+2x+1$$

121. A graph of a function f is one to one iff every horizontal line intersects the graph in at most one point.

True

122. Which of the following is true for the following sequence?

If n is even, then $C_n=2$ and if n is odd, then $C_n = 0$

123. The function ' f ' and ' g ' are inverse of each other if and only if their composition gives_____.

Identity function

124. $N!$ is defined to be _____.

The product of the integers from 1 to n

125. Let $A = \{1,2,3,4\}$ and $B=\{7\}$ then the constant function from A to B

Both one to one and onto

126. A set is called countable if, and only if, it is _____.

Countably infinite and finite

127. If $f(x) = x$ and $g(x) = -x$ are both one to one functions then $(f+g)(x)$ is also one to one function.

False

128. If a is the 1st term and d be the common difference of an arithmetic sequence then the sequence is $a, a+d, a+2d, a+3d, \dots$

True

129. $x+a, x+3a, x+5, \dots$ is a/a_n _____.

Arithmetic sequence

130. inverse of an injective function may not be a function.

True

131. $y=x^3$ is a graph of bijective function from $\mathbb{R}$ to $\mathbb{R}$
False
132. Two functions 'f' and 'g' from x to y are said to be equal if and only if _____.
 $F(x)=g(x)$ for all 'x' belongs to x
133. Common ratio in sequence '36, 12, 4, $4/3$, ...' is
 $1/3$
134. A set is called finite if, and only if, is the _____ or there is -----.
Empty set or one-to-one
135. Let $f(x)=x^2-1$ and $g(x)=x+1$ define functions f and g from $\mathbb{R}$ to $\mathbb{R}$, then $(f/g)(x)$
 $x-1$
136. A graph of a function f is one to one iff every horizontal line intersects the graph in at most one point.
True
137. Let g be a function defined by $g(x) = x+1$. Then the composition of $(g \circ g)$.
 x^2+2x+1
138. $F:X \rightarrow Y$ that is both one to one and onto is called a _____.
Bijective function
139. What does 'r' denotes in a geometric sequence?
Common ratio
140. Let $A=\{1,2,3,4\}$ and $B=\{7\}$ then the constant function from A to B is _____.
Both one to one and onto
141. $n!$ is defined to be _____.
The product of the integers from 1 to n
142. A set is called countable if, and only if, it is _____.

Both b and c

143. Which of the following is the example of an alternating sequence?

$$C_n = n/n+1 \text{ for } n \geq 0$$

144. $X+a, x+3a, x+5a, \dots$ is an _____

Arithmetic sequence

145. $0, -5, -10, -15, \dots$ is an _____.

Arithmetic sequence

146. $5, 9, 13, 17, \dots$ is an _____.

Arithmetic sequence

147. An important data type in computer programming consists of _____.

Finite sequence

148. One-to-one correspondence means the condition of _____.

One-one and onto both

149. Cardinality means the total number of elements in a set.

True

150. Inverse of a function may not be a function.

True

151. The functions 'f' and 'g' are inverse of each other if and only if their composition gives _____.

Identity function

152. A set is called finite if , and only if, it is the _____ or there is _____.

Empty set or one-to-one

153. Let f and g be the two functions from R to R defined by $f(x) = |x|$ and $g(x) = \text{square root } x^2$ for all $x \in R$, then _____.

F(x) is not equal to g(x)

154. If $f^{-1}(x) = 6-x/2$ then $f^{-1}(2)$ is _____.

2

155. Let $f(2)=3$, $g(2)=3$, $f(4)=1$ and $g(4)=2$ then the value of $f \circ g(4)$ is _____.

3

156. An important data type in computer programming consists of _-----.

Finite sequence

157. Let $f(x)=x+3$ then $f^{-1}(x)$ is _____.

$x-3$

158. If $f: X \rightarrow Y$ and $g: Y \rightarrow Z$ are both onto function. Then $g \circ f: X \rightarrow Z$ is _____.

One-to-one function

159. The functions 'f' and 'g' are inverse of each other if and only if their composition gives

Identity function

160. The two function 'f' and 'g' are equal if _____.

$F(x) = 3x$ and $g(x) = 6x^2+3x/2x+1$ for all $x \in \mathbb{R}$

161. Two functions 'f' and 'g' from X To Y are said to be equal if and only if-----.

$F(x)$ and $g(x)$ for all 'x' belongs to X

162. Which of the following set is the domain of a sequence?

Set of natural numbers

163. If 1st term of a geometric sequence is 2 and common ratio is $1/2$, then 3rd term of sequence is _____.

$1/2$

164. Composition of a function is a commutative operation.

True

165. If a function $(g \circ f)(x): X \rightarrow Z$ is defined as $(g \circ f)(x) = g(f(x))$ for all $x \in X$. Then the function _____ is known as composition of f and g.

$(g \circ f)$

166. A set is countably infinite if and only if and only if, it has the same cardinality as the set of _____.

Positive integers

167. The 3rd term of the sequence $b_n = 5^n$ is _____.

125

168. If f is a bijective function then $(f^{-1}(f(x)))$ Is equal to _____.

x

169. Let $f(x) = x$ and $g(x) = -x$ for all $x \in \mathbb{R}$, then $(f+g)(x)$ is _____.

0

170. An infinite sequence may have only a finite number of values.

True

171. The functions $f \circ g$ and $g \circ f$ are always equal .

False

172. If f and g are two one-to-one functions, then their composition that is $g \circ f$ is one-to-one.

True

173. A function whose range consists of only one element is called _____.

Constant function

174. Let $X = \{1, 5, 9\}$ and $Y = \{3, 4, 7\}$. Define a function f from X to Y such that $f(1)=7, f(5)=3, f(9)=4$ then which of the following statement about ' f ' is true?

f is both one-to-one and onto

175. $Y = x^3$ is a graph of bijective function from $\mathbb{R}$ to $\mathbb{R}$.

True

176. A function whose inverse function exists is called a/an_____.

Invertible

177. Let F and g be two functions defined by $f(x) = x+2$ and $g(x) = 2x+1$. Then the composition of f and g is _____.

$$2x + 5$$

178. If r is a positive real number, then the value of r in $3, r, r=-27r$ is

None options

179. The _____ of the terms of a sequence forms a series.

Sum

180. The sum of first five whole number is _____.

$$10$$

181. If $f_k = f_{k-1} + f_{k-2}$ then $f_0 = 1, f_1 = 2$, then $f_2 =$ _____.

$$3$$

MTH202 MID TERM PAST PAPER BY SAQIB

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MCQS:

$$x^2 - 9 = \dots\dots\dots$$

- ▶ $|(x-3)^2|$
- ▶ $|(x+3)^2|$
- ▶ $|x-3||x+3|$
- ▶ $|x+3||x+3|$

Usually the number that signifies the idea of $f(x)$ being as close to limit L as want to be must be δ or ϵ

▶ **Integer**

- ▶ Natural number
- ▶ Small positive number.
- ▶ Small negative number.

A function f is said to be continuous on a closed interval $[a, b]$ if f is continuous from the right at " a " and " f " is continuous from the left at " b " and " f " is continuous on

- ▶ $(a, b]$
- ▶ $[a, b)$
- ▶ $[a, b]$
- ▶ (a, b)

If f is continuous on $[a, b]$, and if $f(a)$ and $f(b)$ have opposite signs, then there is one solution of the equation $f(x) = 0$ in the interval (a, b) .

- ▶ at most
- ▶ exactly
- ▶ **at least**
- ▶ not more than

ϵ (epsilon) used in the definition of limit can be a negative number.

- ▶ True
- ▶ **False**

If a function is differentiable at a point then it is continuous at that point. The converse is

- ▶ False
- ▶ **True**

If the function f and g are continuous at c , then $f + g$ is at c .

- ▶ Discontinuous
- ▶ **Continuous**

If f is continuous on a closed interval $[a, b]$ and C is any number between $f(a)$ and $f(b)$, inclusive, then there is at least one number x in the interval $[a, b]$ such that -----
-

- ▶ $f(x)$ is not equal to C
- ▶ **$f(x) = C$**
- ▶ $f(x) > C$
- ▶ $f(x) < C$

$|x-3| < 1$ implies.....

- ▶ $-4 < x < 4$
- ▶ **$2 < x < 4$**
- ▶ $-2 < x < -4$
- ▶ $x-3 < 1$

If for any positive number ϵ (epsilon) we can find δ (delta) such that $|(3x-5) - 1| < \epsilon$, if x satisfies $0 < |x-2| < \delta$ Then $f(x) = \dots\dots\dots$

- ▶ $3x-5-1$
- ▶ $x-2$
- ▶ **$3x-5$**
- ▶ None of these

Question # 1 of 10 (Start time: 05:59:11 PM) Total Marks: 1

A graph of an equation is the points on the xy - plane that the equation.
Select correct option:

- ▶ **Satisfy**
- ▶ Does not satisfy.

Question # 2 of 10 (Start time: 06:00:12 PM) Total Marks: 1

If two lines have same slope, say 1, then these two lines are _____
Select correct option:

- ▶ **Parallel to each other**
- ▶ Parallel to x -axis
- ▶ Parallel to y -axis
- ▶ Perpendicular to each other

Question # 3 of 10 (Start time: 06:00:57 PM) Total Marks: 1

There is one-to-one correspondence between the points on co-ordinate line and _____
Select correct option:

- ▶ Set of natural numbers
- ▶ Set of integers
- ▶ Set of irrational numbers
- ▶ **Set of real numbers**

Question # 4 of 10 (Start time: 06:02:06 PM) Total Marks: 1

Which of the following is y -intercept of a line represented by equation, $5y = -2x + 16$
Select correct option:

- ▶ 2
- ▶ 5
- ▶ 8
- ▶ 16 / 5

Question # 5 of 10 (Start time: 06:03:11 PM) Total Marks: 1

Does the point (1,2) satisfies the equation: $2y=x^2-1$

Select correct option:

- ▶ Yes
- ▶ No

Question # 6 of 10 (Start time: 06:03:47 PM) Total Marks: 1

Let x is a real variable. The inequality $-5 < x < 2$ denote _____

Select correct option:

- ▶ Set of all rational numbers between -5 and 2
- ▶ Set of all real numbers between -5 and 2.
- ▶ Set of all natural numbers between -5 and 2
- ▶ Set of all integers between -5 and 2

Question # 7 of 10 (Start time: 06:05:01 PM) Total Marks: 1

Which of the following option describes the graph of equation: $(x^2)+(y^2)=1$

Select correct option:

- ▶ A parabola whose vertex is at point (1, 0).
- ▶ A straight line whose slope and y-intercept is 1.
- ▶ A circle centered at origin and its radius is 1
- ▶ None of these

Question # 8 of 10 (Start time: 06:05:55 PM) Total Marks: 1

Graph of the equation $x^2+y^2=9$ represents a.....

Select correct option:

▶ **Circle not sure**

- ▶ Parabola
- ▶ Ellipse
- ▶ None of these.

Question # 9 of 10 (Start time: 06:06:16 PM) Total Marks: 1

Which of the following is distance between the points (2, 5) and (-1, 1)?

Select correct option:

- ▶ Square root of (-7)
- ▶ Square root of (37)
- ▶ 25
- ▶ 5

Question # 10 of 10 (Start time: 06:07:05 PM) Total Marks: 1

The inequality, $\{1 / x\} < 1$ can be simplified to which of the following?

Select correct option:

- ▶ $(1 - x) / x > 0$
- ▶ $(1 - x) / x < 0$
- ▶ $(1 - x) < 0$
- ▶ $(1 - x) > 0$

If $\sin(3x^2) / 6 + C$ is the anti-derivative of a function $f(x)$, then $f(x) = \underline{\hspace{2cm}}$.

- ▶ $x^2 \cos(3x^2)$.
- ▶ **$x \cos(3x^2)$.**
- ▶ $x \cos(3x)$.
- ▶ none

Which of the following is the integral of $\sin(3x+5)$ with respect to x ?

- ▶ $-1/3[-\cos(3x+5)]$
- ▶ **$1/3[-\cos(3x+5)]$**
- ▶ $1/15[-\cos(3x+5)]$
- ▶ $-\cos(3x+5)$

If 'n' goes from 1 to 3 and the summation of ' na ' = $6a$, then the value of 'a' is -----

- ▶ **6**
- ▶ -6
- ▶ 1
- ▶ undetermined

If 'n' goes from 1 to any large ODD number then the summation of ' $(-1)^n$ ' = -----

▶ **-1**

▶ 0

▶ 1

▶ that specific large ODD number

1+2+3.....+t equals

▶ $n(n+1)/2$

▶ **$t(t+1)/2$**

▶ $n(n+1)(2n+1)/6$

▶ none

If definite integral of $f(x)=\sin x$ over $[a,0]$ is equal to '-2' then the value 'a' is-----

▶ $\pi/2$

▶ **π**

▶ 0

▶ $-\pi$

If the definite integral of $f(x)=3$ over $[1,x]$ is greater than '12' then -----

▶ $x>12$

▶ $x>5$

▶ **$x>3$**

▶ $x>1$

If $[-8,8]$ is subdivided into '16' equally spaced subintervals, then the RIGHT end point of 13th sub-interval will be-----.

▶ 2

▶ 3

▶ 4

▶ **5**

Which of the following is the integral of $\sin(2x)$?

- ▶ $\cos(2x)+C$
- ▶ $2\cos(2x)+C$
- ▶ $-(1/2)\cos(2x)+C$
- ▶ none

Sum of cubes of n-terms of a series whose nth term is 'n' = ---

- ▶ Square of $n(n+1)(2n+1)/6$
- ▶ Square of $n(n+1)/2$
- ▶ *Square of $(n+1)/2$ (just a guess)*
- ▶ Square of $n(n+1)/6$

In a rectangular coordinate system the coordinate axes divide the plane into four regions called...

- ▶ Cube
- ▶ **Quadrants**
- ▶ Circle

An equation of the form $y = ax^2 + bx + c$ is called

- ▶ Parabolic
- ▶ Cubic
- ▶ **Quadratic**

Graph of $f(x) = |x|$ is

- ▶ Circle shape
- ▶ **V shaped**
- ▶ U shaped

$Y=f(x) + 3$ translation of the function is at 3 is By c units

- ▶ **Up**
- ▶ Down
- ▶ Left
- ▶ Right

Graph of $y=|x-5|$ of the graph $y=|x|$ 5 units to the right to get the graph of y .

- ▶ Reading
- ▶ **Translation**
- ▶ Creating
- ▶ Definition

By the definition and be on the interval (x_0, x_1)

- ▶ **Greater than zero**
- ▶ Equal to zero
- ▶ Less than zero
- ▶ Less than and equal to zero

$\cot(x)$ discontinuous at

- ▶ $\cos(x) = 0$
- ▶ **$\sin(x) = 0$**
- ▶ $\tan(x) = 0$
- ▶ $\cot(x) = 0$

If a function is differentiable then the function is also on that point

- ▶ Discontinues
- ▶ No exit
- ▶ **Continuous**

$\tan(5-3x)$ find differentiation w.r.t. x

- ▶ **$-3\sec^2(5-3x)$**
- ▶ $3\sec^2(5-3x)$
- ▶ $3\cos(5-3x)$
- ▶ $3\cos^2(5-3x)$

Derivative of the will be solved by Method

- ▶ **Implicit**
- ▶ Explicit
- ▶ Simple

Constant function has the slope

- ▶ Positive
- ▶ Negative
- ▶ **Zero**

Decreasing function has the slope

- ▶ **Negative**
- ▶ Positive
- ▶ Zero

The equation of line of the form is known as

- ▶ Point-slope form
- ▶ Two points form
- ▶ Intercepts form
- ▶ **Slope intercept form**

The set of rational number is a subset of

- ▶ **Integers**
- ▶ Natural numbers
- ▶ Odd integers
- ▶ Real number

If $\sin(3x^2) / 6 + C$ is the anti-derivative of a function $f(x)$, then $f(x) = \underline{\hspace{2cm}}$.

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► 1

► undetermined

If 'n' goes from 1 to any large ODD number then the summation of $(-1)^n = \text{-----}$

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► 0

► 1

► that specific large ODD number

1+2+3.....+t equals

► $n(n+1)/2$

► $t(t+1)/2$

► $n(n+1)(2n+1)/6$

► none

6.If definite integral of $f(x)=\sin x$ over $[a,0]$ is equal to '-2' then the value 'a' is-----

► $\pi/2$

► π

► 0

► $-\pi$

If the definite integral of $f(x)=3$ over $[1,x]$ is greater than '12' then ----

► $x>12$

► $x>5$

► $x>3$ (not sure)

► $x>1$

If $[-8,8]$ is subdivided into '16' equally spaced subintervals, then the RIGHT end point of 13th sub-interval will be-----.

► 2

► 3

► 4

► 5

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► $2\cos(2x)+C$

▶ $-(1/2)\cos(2x)+C$

▶ none

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▶ Square of $n(n+1)/2$

▶ **Square of $(n+1)/2$ (just a guess)**

▶ Square of $n(n+1)/6$

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▶ Down

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▶ Reading

▶ **Translation**

▶ Creating

▶ Definition

By the definition ε and δ be on the interval (x_0, x_1)

► **Greater than zero**

- Equal to zero
- Less than zero
- Less than and equal to zero

Let $f(x)$ is the function as x approaches to 0 then the limit from the positive will be ...

$\lim_{x \rightarrow +0}$
 $\lim_{x \rightarrow -0}$
 $\lim_{x \rightarrow 0}$

$\cot(x)$ discontinuous at

- $\cos(x) = 0$
- **$\sin(x) = 0$**
- $\tan(x) = 0$
- $\cot(x) = 0$

If a function is differentiable then the function is also on that point

- Discontinues
- No exit
- **Continuous**

$\tan(5-3x)$ find differentiation w.r.t. x

- **$-3\sec^2(5-3x)$**
- $3\sec^2(5-3x)$
- $3\cos(5-3x)$
- $3\cos^2(5-3x)$

Derivative of the $7y^4 + x^3y + x = 4$ will be solved by Method

- **Implicit**
- Explicit
- Simple

Constant function has the slope

- Positive
- Negative
- **Zero**

Decreasing function has the slope

► **Negative**

► Positive

► Zero

Consider two function $f(x) = x^2$ and $g(x) = \sqrt{x}$ then $f \circ g(x) = \dots\dots\dots$

► **x**

► x^2

► $\sqrt{x}$

► None of these

A function is said to be continuous function if the function is continuous on the interval

► **$(-\infty, +\infty)$**

► $(0, +\infty)$

► $(-\infty, 0)$

► None of these

According to Power-Rule of differentiation, if $f(x) = x^n$ where n is a real number, then

$$\frac{d}{dx}[x^n] =$$

► x^{n-1}

► **$n x^{n-1}$**

► $n x^{n+1}$

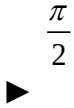
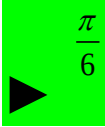
► $(n-1)x^{n+1}$

$$30^0 = \underline{\hspace{2cm}}$$

► $\frac{\pi}{3}$

► $\frac{\pi}{4}$

►



π is a number

- ▶ Integer
- ▶ Rational
- ▶ **Irrational**
- ▶ Natural

The equation of line of the form $y - y_1 = m(x - x_1)$ is known as

▶ **Point-slope form**

- ▶ Two points form
- ▶ Intercepts form
- ▶ Slope intercept form

The set of rational number is a subset of

▶ **Integers**

- ▶ Natural numbers
- ▶ Odd integers
- ▶ Real number

Question # 1 of 10 (Start time: 11:35:52 AM) Total Marks: 1

If $y=f(x)$ then instantaneous rate of change of y with respect to x at the point x_0 is given by slope of tangent line at $(x_0, f(x_0))$

Select correct option:

- ▶ True
- ▶ False

Question # 2 of 10 (Start time: 11:37:09 AM) Total Marks: 1

If a secant line is drawn between two points P and Q on a curve, then the slope of this secant line is

Select correct option:

- ▶ $=f(x_2)-f(x_1)$
- ▶ $=f(x_2)-f(x_1)/x_2$

- ▶ $=\{f(x_2)-f(x_1)\}/(x_2-x_1)$
- ▶ $=f(x_1)-f(x_2)/x_2-x_1$

Question # 3 of 10 (Start time: 11:38:36 AM) Total Marks: 1

For the curve $f(t) = -23t+25$, the slope of the tangent line at point 't = -1' is
Select correct option:

- ▶ 23
- ▶ -23
- ▶ 25
- ▶ -25

Question # 4 of 10 (Start time: 11:40:02 AM) Total Marks: 1

If (0,0) and (2,2) are any two points on a curve then the slope of a line parallel to the secant segment through these points is

Select correct option:

- ▶ 1
- ▶ -1
- ▶ 2
- ▶ -2

Question # 5 of 10 (Start time: 11:41:26 AM) Total Marks: 1

On the straight line, the tangent at any point coincide with line -----
Select correct option:

- ▶ no where
- ▶ every where
- ▶ some where
- ▶ **none of these**

Question # 6 of 10 (Start time: 11:42:54 AM) Total Marks: 1

The process of finding the derivative is called _____
Select correct option:

- ▶ **Differentiation**
- ▶ Integration
- ▶ Function
- ▶ None of these

Question # 7 of 10 (Start time: 11:43:56 AM) Total Marks: 1

If $f(x) = x^3$ then $f'(2) =$ NOTE: x^n means 'x' to the power 'n'
Select correct option:

- ▶ 12
- ▶ 10

- ▶ 14
- ▶ None of these

Question # 8 of 10 (Start time: 11:45:24 AM) Total Marks: 1

If $f(x) = 8x^2 - 2x + 5$, then $f'(0)$ will be.....

Select correct option:

- ▶ 4
- ▶ -2
- ▶ -3
- ▶ -1

Question # 9 of 10 (Start time: 11:46:54 AM) Total Marks: 1

If the function is differentiable at a point then it is also at that point

Select correct option:

- ▶ **Continuous**
- ▶ Not defined

Question # 10 of 10 (Start time: 11:48:06 AM) Total Marks: 1

If $f(x) = 3x^2 + 2$, then $f'(x)$ will be _____. (Note: x^2 means 'x' raised to the power 2)

Select correct option:

- ▶ $3x + 2$
- ▶ $6x$
- ▶ $6x + 2$
- ▶ None of these

Question # 1 of 10 (Start time: 11:35:52 AM) Total Marks: 1

If $y = f(x)$ then instantaneous rate of change of y with respect to x at the point x_0 is given by slope of tangent line at $(x_0, f(x_0))$

Select correct option:

- ▶ True
- ▶ False

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If a secant line is drawn between two points P and Q on a curve, then the slope of this secant line is

Select correct option:

- ▶ $= f(x_2) - f(x_1)$
- ▶ $= f(x_2) - f(x_1) / x_2$
- ▶ $= \{f(x_2) - f(x_1)\} / (x_2 - x_1)$
- ▶ $= f(x_1) - f(x_2) / x_2 - x_1$

Question # 3 of 10 (Start time: 11:38:36 AM) Total Marks: 1

For the curve $f(t) = -23t + 25$, the slope of the tangent line at point ' $t = -1$ ' is
Select correct option:

- ▶ 23
- ▶ -23
- ▶ 25
- ▶ -25

Question # 4 of 10 (Start time: 11:40:02 AM) Total Marks: 1

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- ▶ 1
- ▶ -1
- ▶ 2
- ▶ -2

Question # 5 of 10 (Start time: 11:41:26 AM) Total Marks: 1

On the straight line, the tangent at any point coincide with line -----
Select correct option:

- ▶ no where
- ▶ every where
- ▶ some where
- ▶ **none of these**

Question # 6 of 10 (Start time: 11:42:54 AM) Total Marks: 1

The process of finding the derivative is called _____
Select correct option:

- ▶ **Differentiation**
- ▶ Integration
- ▶ Function
- ▶ None of these

Question # 7 of 10 (Start time: 11:43:56 AM) Total Marks: 1

If $f(x) = x^3$ then $f'(2) =$ NOTE: x^n means ' x ' to the power ' n '
Select correct option:

- ▶ 12
- ▶ 10
- ▶ 14
- ▶ None of these

Question # 8 of 10 (Start time: 11:45:24 AM) Total Marks: 1

If $f(x) = 8x^2 - 2x + 5$, then $f'(0)$ will be.....

Select correct option:

- ▶ 4
- ▶ -2
- ▶ -3
- ▶ -1

Question # 9 of 10 (Start time: 11:46:54 AM) Total Marks: 1

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Select correct option:

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If $f(x) = 3x^2 + 2$, then $f'(x)$ will be _____. (Note: x^2 means 'x' raised to the power 2)

Select correct option:

- ▶ $3x + 2$
- ▶ $6x$
- ▶ $6x + 2$
- ▶ None of these

Area of a rectangle whose width is 5 units and length is 6 units will be

Select correct option:

- 11 units
- 22 units

Question # 4 of 10 (Start time: 09:02:47 PM)

Total Marks: 1

If Newton's Method succeeded to get the approximate solution of an equation, then which of the following is NOT true about it.

Select correct option:

- The slope of the tangent line (at any approximated point) must be non zero.
- The tangent line (at any approximated point) is not parallel to x-axis.
- The sequence of approximated points not convergent to the exact solution
- None of these.

Question # 5 of 10 (Start time: 09:04:16 PM)

Total Marks: 1

Integral of $(1-2x)$ from $[0,1]$ is

Select correct option:

- 1
- 2
- 0
- 3

Question # 6 of 10 (Start time: 09:05:21 PM)

Total Marks: 1

If $f(x) = \cos(x) + x$, then which of the following is NOT true about it.

Select correct option:

- Its anti – derivative is $\sin(x) + x^2/2 + 4$.
- Its anti – derivative is $\sin(x) + x^2/2 + 6$.
- Its anti – derivative is $\sin(x) + x^2/2 + 10$.
- Its anti – derivative is $-\sin(x) + x^2/2 + 4$.

Question # 7 of 10 (Start time: 09:06:54 PM)

Total Marks: 1

Integral of x^5 is NOTE: x^n means 'x' to the power 'n'

Select correct option:

- $(1/3)x^6$
- 10
- $25x$
- None of these

Question # 8 of 10 (Start time: 09:08:19 PM)

Total Marks: 1

In the indefinite integral of $x(y^2)$ w.r.t 'y' , the term serve to identify the independent variable in the function.

Select correct option:

- X
- Y
- dy
- y^2

Question # 10 of 10 (Start time: 09:11:20 PM)

Total Marks: 1

If $f(x) = \sin(5x)$, then which of the following is NOT true about it.

Select correct option:

Its anti – derivative can be

$$-\cos(5x) + 3$$

Its anti – derivative can be

$$-\cos(5x) / 5 + 4.$$

Its anti – derivative can be

$$-\cos(5x) / 5 + 6.$$

Its anti – derivative can be

$$-\cos(5x) / 5 + 10.$$

Quiz Start Time: 08:24 PM

Question # 1 of 10 (Start time: 08:24:49 PM)

Derivative of difference equal to

Select correct option:

☒	Difference of the derivatives
☐	Sum of the derivatives

Quiz Start Time: 08:24 PM

Question # 2 of 10 (Start time: 08:25:05 PM)

The function $f(x) = |x|$ is differentiable in the interval $(0, +\infty)$

Select correct option:

☐	True
☐	False

Quiz Start Time: 08:24 PM

Question # 3 of 10 (Start time: 08:25:30 PM)

Total Marks

If $y=x^2$ then average rate of change of y with respect to x over the interval $[1, 2]$ is NOTE: x^n means 'x to the power 'n'

Select correct option:

☐	3
☐	2
☐	1
☐	None of these

Quiz Start Time: 08:24 PM

Question # 4 of 10 (Start time: 08:26:26 PM)

What is the derivative
of

$$39x^{\frac{14}{19}}$$

Select correct option:

☐	$42x^{\frac{1}{19}}$
☐	$24x^{\frac{-1}{19}}$
☐	$42x$
☐	None of these

Quiz Start Time: 08:24 PM

Question # 5 of 10 (Start time: 08:27:44 PM)

Derivative exists only at the points where
limit_____

Select correct option:

☐	Does not exist
☐	Exist
☐	May or may not exist
☐	None of these

Quiz Start Time: 08:24 PM

Question # 6 of 10 (Start time: 08:27:57 PM)

On the geometrical figure like square, the points where the derivative does not exist are -----

Select correct option:

☐	midpoints of its diagonals
☐	midpoints of its sides
☐	corners
☐	the points of trisection of its sides

Quiz Start Time: 08:24 PM

Question # 7 of 10 (Start time: 08:28:36 PM)

On the straight line, the tangent at any point coincide with line –

Select correct option:

☐	no where
☐	every where
☐	some where
☐	none of these

question no 8

Quiz Start Time: 08:24 PM

Question # 8 of 10 (Start time: 08:29:01 PM)

If $y=f(x)$ then the average rate of change of y with respect to x over the interval $[x_0, x_1]$ is slope of secant line joining points $(x_0, f(x_0))$ and $(x_1, f(x_1))$ on the graph of f .

Select correct option:

☐	True
☐	False

Quiz Start Time: 08:24 PM

Question # 10 of 10 (Start time: 08:29:41 PM)

If $f(x) = \sec(x)$ and $g(x) = \tan(2x)$, then the derivative of $f(x) - g(x)$ is _____. NOTE: - where x^n denotes the power of x .

Select correct option:

☐	$\sec(x) - 2\tan(x)$
☐	$\sec(x) - 2\tan(2x)$
☐	$\sec(x) + 2\tan(x)$
☐	$\sec(x)\tan(x) - 2\sec^2(2x)$

Question # 1 of 10 (Start time: 11:06:59 PM)

Let $y = x^2 + 1$ Then the instantaneous rate of change of y with respect to x at the point -2 is

Select correct option:

☐	-4
☐	0
☐	3
☐	-1

Question # 2 of 10 (Start time: 11:08:26 PM)

Derivative of

$$3x^7 + 4x^2 + 9$$

is

Select correct option:

☐	$21x^6 + 8x$
☐	$21x^6 + 8x + 9$
☐	$21x^6 + 4x^2 + 9$
☐	None of these

Question # 7 of 10 (Start time: 11:13:44 PM)

If

$$f(x) = x^5 + 10$$

, then which of the following is true about it?

Select correct option:

☐	Its derivative is x^4
☐	Its derivative is $5x^4$
☐	Its derivative is 10.
☐	None of these.

Question # 10 of 10 (Start time: 11:16:49 PM)

What is the derivative
of

$$39x^{\frac{14}{13}}$$

Select correct option:

☐	$42x^{\frac{1}{13}}$
☐	$24x^{\frac{-1}{13}}$
☐	$42x$
☐	None of these

Laws of Logic.

1. **Cumulative Law**

$$p \wedge q = q \wedge p$$

$$p \vee q = q \vee p$$

2. **Associative Law**

$$(p \wedge q) \wedge r = p \wedge (q \wedge r)$$

$$(p \vee q) \vee r = p \vee (q \vee r)$$

3. **Distributive Law**

$$p \wedge (q \vee r) = (p \wedge q) \vee (p \wedge r)$$

$$p \vee (q \wedge r) = (p \vee q) \wedge (p \vee r)$$

4. **Idempotent Law**

$$p \wedge p = p$$

$$p \vee p = p$$

5. **De-Morgans Law**

$$\sim (p \wedge q) = \sim p \vee \sim q$$

$$\sim (p \vee q) = \sim p \wedge \sim q$$

6. **Absorption Law**

$$p \vee (p \wedge q) = p$$

$$p \wedge (p \vee q) = p$$

7. **Identity Law**

$$p \wedge t = p$$

$$p \vee c = p$$

8. **Universal Bond Law**

$$p \vee t = t$$

$$p \wedge c = c$$

9. **Negation Law**

$$p \vee \sim p = t \quad (\text{Tautology})$$

$$p \wedge \sim p = c \quad (\text{Contradiction})$$

10. **Negation of t and c**

$$\sim t = c$$

$$\sim c = t$$

11. **Double Negation Law**

$$\sim(\sim p) = p$$

Set Identities.

Let A,B, and C be subsets of a Universal set U. then

1. **Idempotent Law:**

a. $A \cup A = A$, b. $A \cap A = A$

2. **Commutative Law:**

a. $A \cup B = B \cup A$, b. $A \cap B = B \cap A$

3. **Associative Law:**

a. $A \cup (B \cup C) = (A \cup B) \cup C$,

b. $A \cap (B \cap C) = (A \cap B) \cap C$

4. **Distributive Law:**

a. $A \cup (B \cap C) = (A \cup B) \cap (A \cup C)$,

b. $A \cap (B \cup C) = (A \cap B) \cup (A \cap C)$

5. **Identity Laws:**

a. $A \cup \emptyset = A$, b. $A \cap \emptyset = \emptyset$

c. $A \cup U = U$, d. $A \cap U = A$

6. **Complement Laws:**

a. $A \cup A^c = U$, b. $A \cap A^c = \emptyset$

c. $U^c = \emptyset$, d. $\emptyset^c = U$

7. **Double Complement Law:**

a. $(A^c)^c = A$,

8. **De-Morgan's Law:**

a. $(A \cup B)^c = A^c \cap B^c$, b. $(A \cap B)^c = A^c \cup B^c$

9. **Alternate Representation for Set Difference:**

$$A - B = A \cap B^c$$

10. **Subset Laws:**

a. $A \cup B \subseteq C$ iff $A \subseteq C$ and $B \subseteq C$

c. $C \subseteq A \cap B$ iff $C \subseteq A$ and $C \subseteq B$

11. Absorption Laws:

a. $A \cup (A \cap B) = A$, b. $A \cap (A \cup B) = A$

Implications(Conditional)& Bi-Conditional

Implication (Conditional) $\rightarrow$

- 1- a. $p \rightarrow q \equiv \sim q \rightarrow \sim p$, b. $p \rightarrow q \equiv \sim p \vee q$
- 2- if $p \rightarrow q$, then its **inverse** is $\sim p \rightarrow \sim q$
- 3- if $p \rightarrow q$, then its **converse** is $q \rightarrow p$
 $\rightarrow$ operator is not a commutative coz $p \rightarrow q \neq q \rightarrow p$
- 4- if $p \rightarrow q$, then its **contra positive** is $\sim q \rightarrow \sim p$
so $p \rightarrow q \equiv \sim q \rightarrow \sim p$, so implication is equivalent to its contra positive.

Bi-Conditional $\leftrightarrow$

- 1- $p \leftrightarrow q \equiv (p \rightarrow q) \wedge (q \rightarrow p)$
- 2- $\sim p \leftrightarrow q \equiv p \leftrightarrow \sim q$

Laws of Logic.

- 1- Commutative Law : $p \leftrightarrow q \equiv q \leftrightarrow p$
- 2- Implication Law: $p \rightarrow q \equiv \sim p \vee q$
 $\equiv \sim (p \wedge \sim q)$
- 3- Exportation Law: $(p \wedge q) \rightarrow r \equiv p \rightarrow (q \rightarrow r)$
- 4- Equivalence: $p \leftrightarrow q \equiv (p \rightarrow q) \wedge (q \rightarrow p)$
- 5- Reductio ad absurdum: $p \rightarrow q \equiv (p \wedge \sim q) \rightarrow c$

1.

Solution:

$$f: \mathbb{R} \rightarrow \mathbb{R}$$

$$g: \mathbb{R} \rightarrow \mathbb{R}$$

$$f(x) = x^2 \quad g(x) = 3x + 1$$

$$(f \circ g)(x) = f[g(x)]$$

$$= f[3x + 1]$$

$$= (3x + 1)^2$$

$$= 9x^2 + 6x + 1$$

$$(g \circ f)(x) = g[f(x)]$$

$$= g[x^2]$$

$$= 3(x^2) + 1$$

$$= 3x^2 + 1$$

We observe that $f \circ g \neq g \circ f$, that is the commutative law does not hold for the composition of functions.

2.

Solution:

$$f: \mathbb{R} \rightarrow \mathbb{R}$$

$$f(x) = x^2 - 3x + 2$$

$$(f \circ f)(x) = f[f(x)]$$

$$= f(x^2 - 3x + 2)$$

$$= (x^2 - 3x + 2)^2 - 3(x^2 - 3x + 2) + 2$$

$$= x^4 + 9x^2 + 4 - 6x^3 - 12x + 4x^2$$

$$- 3x^2 + 9x - 6 + 2$$

$$= x^4 - 6x^3 + 10x^2 - 3x.$$

3.

$f: \mathbb{R} \rightarrow \mathbb{R}$ defined by $f(x) = x^2 + 3x + 1$

$g: \mathbb{R} \rightarrow \mathbb{R}$ defined by $g(x) = 2x - 3$

i. $f \circ g(x) = f[g(x)]$

$$= f[2x - 3]$$

$$= (2x - 3)^2 + 3(2x - 3) + 1$$

$$= 4x^2 - 12x + 9 + 6x - 9 + 1$$

$$= 4x^2 - 6x + 1$$

ii. $g \circ f(x) = g[f(x)]$

$$= g[x^2 + 3x + 1]$$

$$= 2(x^2 + 3x + 1) - 3$$

$$= 2x^2 + 6x + 2 - 3$$

$$= 2x^2 + 6x - 1$$

iii. $f \circ f(x) = f[f(x)]$

$$= f[x^2 + 3x + 1]$$

$$= (x^2 + 3x + 1)^2 + 3(x^2 + 3x + 1) + 1$$

$$= x^4 + 11x^2 + 1 + 6x^3 + 6x + 3x^2 + 9x + 3 + 1$$

$$= x^4 + 6x^3 + 14x^2 + 15x + 5$$

iv. $g \circ g(x) = g[g(x)]$

$$= g[2x - 3]$$

$$= 2(2x - 3) - 3$$

$$= 4x - 6 - 3$$

$$= 4x - 9$$

4.

$f: \mathbb{R} \rightarrow \mathbb{R}$ defined by $f(x) = x + 1$

$g: \mathbb{R} \rightarrow \mathbb{R}$ defined by $g(x) = x - 1$

$$f \circ g(x) = f[g(x)]$$

$$= f(x - 1)$$

$$= (x - 1) + 1$$

$$= x$$

$$g \circ f(x) = g[f(x)]$$

$$= g[x + 1]$$

$$= (x + 1) - 1$$

$$= x$$

$$\therefore f \circ g = g \circ f = I_{\mathbb{R}}$$

$I_{\mathbb{R}}$ is the identity function.

$$\therefore I_{\mathbb{R}}(x) = x.$$

5.

$f: \mathbb{N} \rightarrow \mathbb{Z}_0$ defined by $f(x) = 2x$

$g: \mathbb{Z}_0 \rightarrow \mathbb{Q}$ defined by $g(x) = 1/x$

$h: \mathbb{Q} \rightarrow \mathbb{R}$ defined by $h(x) = 5x + 2$

To verify associativity we have to prove that $h \circ (g \circ f) = (h \circ g) \circ f$.

Consider

$$[h \circ (g \circ f)](x) = h[(g \circ f)(x)]$$

$$= h[g(f(x))]$$

$$= h[g(2x)]$$

$$= h[1/2x]$$

$$= 5 * 1/2x + 2$$

$$= 5/2x + 2$$

$$[(\text{hog})\text{of}] (x) = (\text{hog}) [f(x)]$$

$$= (\text{hog}) (2x)$$

$$= h [g (2x)]$$

$$= h (1/2x)$$

$$= 5 * 1/2x + 2$$

$$= 5/2x + 2$$

6.

$f: \mathbb{R} \rightarrow \mathbb{R}$ is the identity function

$$\Rightarrow f(x) = x$$

$$\text{fof} (x) = f [f(x)]$$

$$= f (x)$$

$$= x$$

$$(\text{ff}) (x) = f (x) * f (x)$$

$$= x * x$$

$$= x^2$$

What is the smallest integer N such that

a. $\lceil N/7 \rceil = 5$ b. $\lceil N/9 \rceil = 6$

SOLUTION:

a. $N = 7 \cdot (5 - 1) + 1 = 7 \cdot 4 + 1 = 29$

b. $N = 9 \cdot (6 - 1) + 1 = 9 \cdot 5 + 1 = 46$

EXAMPLE:

Use the Euclidean algorithm to find $\gcd(330, 156)$

Solution:

1. Divide 330 by 156:

This gives $330 = 156 \cdot 2 + 18$

2. Divide 156 by 18:

This gives $156 = 18 \cdot 8 + 12$

3. Divide 18 by 12:

This gives $18 = 12 \cdot 1 + 6$

4. Divide 12 by 6:

This gives $12 = 6 \cdot 2 + 0$

Hence $\gcd(330, 156) = 6$.

MTH202 900+ MIDTERM MCQS

SEARCHING FILE FOR GRAND QUIZ

CREATE BY ORANGE MONKEY TEAM

1st file 95% confirm

1. A function from B to A is called onto function if its range is:

A

2. If $p =$ It is raining $q =$ She will go to college

$q \wedge \neg p$

3. A subset f of $B \times A$ is said to be a function from B to A if the domain of f is B and the first element of order pairs of f :

Does not repeat

4. The negation of "Today is Monday" is:

Today is not Monday

5. A function in which the second element of order pair is distinct is called:

One-one function

6. The converse of the conditional statement $q \longrightarrow p$ is:

$p \longrightarrow q$

7. Letters of SAP taken all at a time can be written in:

6 ways

8. Contra-positive of the given statement "If two angles are congruent, then they have the

same measure” is:

If two angles do not have the same measure, then they are not congruent

9. A student has a maximum of 720 words from a combination of letters of a word given word is:

CANADA

10. The statement “It is not raining if and only if roads are dry” is logically equivalent to:
Roads are dry if and only if it is not raining

11. The inverse of this statement If p, then q is:
If not p, then not q

12. A converse of this statement If p, then q is:
If q, then p

13. How many bytes are required to encode 2000 bits of data:
2

14. A collection of graph is:
vertices and columns

15. The number of edges in a complete graph with ‘n’ vertices is equal to:
 $n(n-1)/2$

16. Error correcting code is a _____
hamming code

17. The symbol II is ASCII stands for:
American Standard Code for Information Interchange

18. What is domain of function $f(x) = x^{1/2}$:
 $[0, \infty)$

19. ordered collection of objects is:
set

20. A function is a Domain of:
the maximal set of numbers for which a function is defined

21. Range of a function is :
the maximal set of numbers which a function can take values

22. In an undirected graph the number of nodes with odd degree must be:
Even

23. What is the cardinality of the set of odd positive integers less than 10?

5

24. The Gray code of a number whose binary representation is 1000 is:

1100

25. The domain of a relation R from A to B is symbolically written as;

$\text{Dom}(R) = \{a \in A \mid (a, b) \in R\}$

26. The number of element is the power set of P(not empty set) denoted by P(not empty set)) is

Not empty set

27. The number of element is the power set of P(not empty set) denoted by P(P(P(not empty set))) is

4

28. Let A be a non-empty set and P(A) the power set of A. Define the 'subset' relation, $\underline{C}$, as follows; for all X,Y belong to P(a), $X \underline{C} Y \leftrightarrow \text{FOR ALL } x, \text{ iff } x \text{ belong to } X, \text{ Then } \underline{C} \text{ is}$

$\underline{C}$ is a partial order relation

29. X belongs to A and x belongs to B, there x belongs to _____.

A unoin B

30. $A \cap B =$ _____
 $\{x \in U \mid x \in A \text{ and } x \in B\}$

31. $A \cup B =$ _____.

$\{x \in U \mid x \in A \text{ or } x \in B\}$

32. If $A \cap B =$ not empty set then A and B are called _____.

Overlapping

33. Let t be tautology, then $\sim(\sim t)$ is _____.

t

34. Let the set $A = \{1, 2, 3, 4\}$ Then the relation $\{(2, 4), (4, 2)\}$ is _____.

Symmetric

35. Sets are denoted by _____.

Capital letter

36. The objects are _____.

Elements or members of the set

37. The elements of a set are represented by _____.

Lower case letter

38. Let p be true and q be false, then $p \wedge \sim q$ is _____.

True

39. If $f(x) = x$ and $g(x) = -x$ are both one to one functions then $(f + g)(x)$ is also one to one function.

True

40. In the digital circuits, ON represents _____.

True or 1

41. Let R and S be reflexive relations on a set A then $R \cap S$ is reflexive.

True

42. There is at least one loop in the graph of an irreflexive relation

False

43. There is no loop in the graph of an irreflexive relation.

True

44. Complement of U is _____.

$\emptyset$

45. Let $p = I$ am hard working, $q = I$ am intelligent, Then $\sim p \wedge q$ means _____

I am not hardworking But I am intelligent

46. IF $(p \text{ XOR } q)$ is True, then _____.

p is true, q is true

47. Which of the following is a right biconditional statement.

It is hot outside and I will buy an ice cream...

48. Truth value of $(3+1=4) \wedge (5 \text{ is an odd number})$ is _____.

False

49. In the matrix representation of an irreflexive relation all the entries in the main diagonal are.....

0

50. Vertical line test is used to determine that whether the graph of a relation is a function or not.

True

51. IF $p \rightarrow q$ is false then $\sim p \rightarrow \sim q$ will be _____.

False

52. $A \cup B = B \cup A$, $A \cap B = B \cap A$ are called

Commutative laws

53. Let R be a binary relation on a set A . R is anti-symmetric iff _____.

$a, b \in A$ if $(a, b) \in R$ and $(b, a) \in R$ then $a = b$.

54. Let R be a relation on a set A . R is symmetric if, and only if,

$a, b \in A$, if $(a, b) \in R$, then $(b, a) \in R$.

55. R is not reflexive iff there is an element " a " in A such that
 $(a, a) \notin R$

56. In the matrix representation of an reflexive relation all the entries in the main diagonal are.....

1

57. R is not transitive iff there are elements a, b, c in A such that

if $(a, b) \in R$ and $(b, c) \in R$ but $(a, c) \notin R$.

58. For the null relation $\emptyset$ on A to be symmetric, it must satisfy the implication

if $(a, b) \in \emptyset$ then $(b, a) \in \emptyset$ symmetric

59. The universal relation $A \times A$ is symmetric, for it contains all ordered pairs of elements of A . Thus,

if $(a, b) \in A \times A$ then $(b, a) \in A \times A$ for all a, b in A symmetric

60. The null relation $\emptyset$ on A is transitive, because the implication.

if $(a, b) \in \emptyset$ and $(b, c) \in \emptyset$ then $(a, c) \in \emptyset$ is true by default,
since the condition $(a, b) \in \emptyset$ is always false

61. The universal relation $A \times A$ is transitive for it contains all ordered pairs of elements of A .

if $(a, b) \in A \times A$ and $(b, c) \in A \times A$ then $(a, c) \in A \times A$

62. Let A be subset of universal set U then $A \cup A^c =$

U

63. Let A be subset of universal set U then $A \cap A^c =$

$\emptyset$

64. Let A be subset of universal set U then $A^c =$

$U - A$

65. $\sim p$ is True when _____.

p is false

66. Let R and S be reflexive relations on a set A then $R \cap S$ is reflexive.

True

67. If $p = T, q = T, r = T$, then $r \leftrightarrow$ will be _____.

T

68. Which of the logical expressions represents the sentence you read stories daily, then your vocabulary will increase and conversely. ?

$p \rightarrow q$

69. P is sufficient for q means ' $p \rightarrow q$ '

True

70. "p only if q" $p \rightarrow q$.

True

71. if p, q" $p \rightarrow q$ is

True

72. "p implies q" $p \rightarrow q$

True

73. if p then q" $p \rightarrow q$

True

74. "not p unless q" $p \rightarrow q$

True

75. q follows from p" $p \rightarrow q$

True

76. "q if p" $p \rightarrow q$

True

77. "q whenever p" $p \rightarrow q$

True

78. "q is necessary for p" $p \rightarrow q$

True

79. The function defined from Z to Z as $f(x) = 1/(x+2)(x-2)$ is not well defined because _____.

Function is not defined at $x = -2$ and $x = 2$

80. The function defined from Z to Z as $f(n) = \frac{1}{n}$ is not well defined because

f is not well defined since each integer n has two images +n and -n

81. The function defined from Z to Z as $f(n) = \text{square root } n$ is not well defined because

f is not defined for $n < 0$ since f then results in imaginary values (not real)

82. The function defined from Z to Z as $f(n) = \text{square root}(n^2+1)$ is not well defined because

f is well defined because each integer has unique (one and only one) image in R under f.

83. Generally, (s AND t) is _____, where t is tautology

S

84. Which of the following is not a binary operation on the set of integers?

- Or subtraction.....both

85. Which of the following are binary operations on the set of natural numbers N.

+ and . or addition or multiplication.....both

86. Which of the following is a binary operation on Z, the set of integers.

- Or subtraction ...both

87. Which of the following is a binary operation on the set of non-zero rational numbers $Q - \{0\}$.

Division

88. Which of the following is not a binary operation on Z.

Division

89. If the conclusion is True for the true premises, then the argument is called as _____.

Valid

90. If the conclusion is false for the true premises, then the argument is called as _____.

Invalid

91. $A = \{ 1, 2 \}$ $B = \{ 3, 4 \}$, $R = \{ (1, 3) (2, 4) \}$. Then the complement of R is _____.

$\{(1, 4) (2, 3)\}$

92. Let $p = 1$ am not a student, then $\sim(\sim p)$ represents _____.

I am not a student

93. Let $p \rightarrow q$ be a conditional statement, then the statement $q \rightarrow p$ is called.

Converse

94. The switches in series acts just like _____.

AND gate

95. $Y = x^3$ is a graph of bijective function from R to R

True

96. Let A, B, C be subset of universal set U then the distributive Law is ...

$$A \wedge (B \vee C) \equiv (A \wedge B) \vee (A \wedge C)$$

$$A \vee (B \wedge C) \equiv (A \vee B) \wedge (A \vee C)$$

97. Composite relation symbolically written as _____.

$$\text{So } R = \{(a,c) | a \in A, c \in C, \exists b \in B, (a,b) \in R \text{ and } (b,c) \in S\}$$

98. Inverse of a function may not be a function.

True

99. Let f and g be two function defined by $f(x) = x+2$ and $g(x) = 2x+1$. THEN the composition of f and g is _____.

$$2x^2 + 5x + 2$$

100. Truth value of $\forall x \vee q$ will be

101. The set of natural number is equal to _____.

The set of positive integers

102. Let R be a binary relation on a set A. If R is anti symmetric then _____.

Inverse of R is antisymmetric

103. Let R be a binary relation on a set If R is transitive, then

Inverse of R is transitive

104. Let R be a binary relation on a set If R is symmetric, then

Inverse of R is symmetric

105. Let R be a binary relation on a set If R is reflexive, then

Inverse of R is reflexive

106. What is the truth value of the sentence ? It rains if and only if there are clouds.

False

107. What is the truth value of the sentence ? It rains if and only if it is a weekend day.

True

108. What is the truth value if the sentence?. You buy an ice cream cone if and only if it is hot outside

True

109. What is the truth value of the sentence? You win the contest if and only if you hold the only winning ticket.

True

110. What is the truth value of the sentence?. You will be informed if and only if you read the news paper every day

True

111. What is the truth value of the sentence?. The train runs late if and only if it is a day I take the train.

True

112. What is the truth value of the sentence?. This number is divisible by 6 if and only if it is divisible by both 2 and 3.

True

113. If $p \rightarrow q$ is false then Truth value of $p \leftrightarrow q$ is

True

114. The logic Gate OR and AND are uniary operation $\{0,1\}$

False

115. The logic gate NOT is a uniary operation on $\{0,1\}$

True

116. The logic gates OR and AND are binary operations on $\{0,1\}$

True

117. The logical connectives $\vee, \wedge, \rightarrow, \leftrightarrow$ are binary operations on the set $\{T, F\}$

True

118. The set operations union $\cup$, intersection $\cap$ and set difference $-$, are binary operators on the power set $P(A)$ of any set A .

True

119. The logical expression $p \leftrightarrow q$ is equal to _____.

$(p \rightarrow q) \wedge (q \rightarrow p)$

120. A function whose inverse function exists is called /an
invertible function.

121. Let $X = \{1, 5, 9\}$ and $Y = \{3, 4, 7\}$. Define $g: X \rightarrow Y$ by specifying that $f(1) = 7$, $f(5) = 3$, $f(9) = 4$ then which of the following statement about f is true

F is both one-to-one and onto

122. Which of the following is not true for an identity function?

The identity function is always a constant function

123. Let $p =$ I am hard working, the $\sim(\sim p)$ represents _____.

I am hard working

124. Which of the following is not a representation of a relation?

Venn diagram

125. Common ratio in sequence '36, 12, 4, $4/3$, ... ' is

$1/3$

126. Common ratio in sequence 1, 2, 4, 8, 16, ...

2

127. Common ratio in sequence 3, $-3/2$, $3/4$, $-3/8$, ...

$-1/2$

128. Common ratio in sequence 0.1, 0.01, 0.001, 0.0001, ...

0.1 or $1/10$

129. if $x \equiv 17 \pmod{5}$ Which of the following integers are valid solution for x ?

12

130. A set is called finite if, and only if, it is the _____ or there is _____

Empty set or onto

131. If a relation $R = \{(1, 2), (2, 3), (3, 4), (4, 1), (2, 2)\}$ is given then which of the following is true about

R is anti symmetric

132. The statement 'Islamabad is the capital of Pakistan AND aau chand is the capital of

U.A.E is a _____.

Conjunction

133. Let A and B be subset of universal set U then $A - (A - B) =$

$$A \cap B$$

134. $P \leftrightarrow q$ is true when _____.

P is false, q is false

135. Let $A = \{1, 2, 3, \dots, 50\}$ and $B = \{2, 4, 6, 8, 10\}$. Then the Cartesian product of A and B has _____ elements.

250

136. Cartesian product of A and B, denoted by $A \times B$ (read as "A cross B") is the set of all ordered pairs (a, b), where a is in A and b is in B.

$$A \times B = \{(a, b) \mid a \in A \text{ and } b \in B\}$$

137. The domain of a relation R from A to B is the set of all first elements of the ordered pairs which belong to R denoted by $\text{Dom}(R)$.

$$\text{Dom}(R) = \{a \in A \mid (a, b) \in R\}$$

138. The range of a relation R from A to B is the set of all second elements of the ordered pairs which belong to R denoted by $\text{Ran}(R)$.

$$\text{Ran}(R) = \{b \in B \mid (a, b) \in R\}$$

139. Define a binary relation R from A to B as follows:

$$R = \{(a, b) \in A \times B \mid a < b\}$$

140. Let $A = \{1, 2, 3, 4\}$ and define the following relations on A Then $R = \{(1, 3), (1, 4), (2, 3), (2, 4), (3, 1), (3, 4)\}$ is _____.

R is irreflexive

141. If $A = \{1, 2, 3\}$ is a set and $R = \{(2, 3), (2, 2), (3, 4)\}$ is a relation on A, then R is

None of these

142. R is not transitive iff there are elements a, b, c in A such that

if $(a, b) \in R$ and $(b, c) \in R$ but $(a, c) \notin R$

143. $Y + 7 = 10$ is a proposition?

False

144. Let $P(n)$ be a propositional function defined for all positive integers n . $P(n)$ is true for every positive integer n if

Principal of mathematical induction

145. Grass is green is a proposition.

True

146. $4 + 2 = 6$ is a proposition.

True

147. $4 + 2 = 7$ is a proposition.

True

148. There are four fingers in a hand is a proposition

True

149. Close the door is not a proposition.

True

150. x is greater than 2 is not a proposition.

True

151. He is very rich is not a proposition.

True

152. Operation of subtraction is a binary operation on the set of _____.

Integers

153. Let R be a relation on a set A . If R is symmetric then its compliment is.

Symmetric relation

154. Let R be a relation on a set A . R is reflexive if and only if, for all $a \in A$, $(a, a) \in R$ or equivalently aRa . That is, each element of A is related to itself.

Reflexive relation

155. Let R be a relation on a set A . R is transitive if and only if for all $a, b, c \in A$, if $(a, b) \in R$ and $(b, c) \in R$ then $(a, c) \in R$.

Transitive relation

156. If $p \leftrightarrow$ is true, then _____.

P and q both are true

157. The 3rd term of the sequence $b_n = 5^n$ is _____.

125

158. Which of the following biconditional statement is true _____.

$1+1 = 3$ if and only if earth is flat

159. Let $A = \{0, 1, 2\}$ and $R = \{(0, 2), (1, 1), (2, 0)\}$ be a relation on A. Then which of the following statement about R is true?

R is symmetric

160. Let p be True and q be True, then $(\sim p \text{ AND } q)$ is

False

161. $9!/6! =$ _____.

504

162. Let $f: X \rightarrow Y$. The range of f consists of those elements of Y that are image of elements of X

Range of a function

163. Let f be a function from $X = \{2, 4, 5\}$ to $Y = \{1, 2, 4, 6\}$ defined as; $f = \{(2, 6), (4, 2), (5, 1)\}$ Then range of f is _____.

1, 2, 6

164. If A is defined as the set of English alphabets then the cardinality of A is _____.

26

165. If A is defined as the set of 467 people then the birthday of A is _____.

366 possible birthday

166. . Among any group of 367 people, there must be at least two with the same birthday, because there are only

366 possible birthday

167. If $(p \text{ XOR } q)$ is true, then _____.

P is false, q is true

168. The negation of the conditional statement ' if I work hard, then I will get A grade' is _____.

I do not work hard AND I will not get a grade mark

169. If $p = \text{true}$ and $q = \text{true}$ then the truth value of $p \text{ XOR } q$ will be _____.

False

170. If $p = \text{False}$ and $q = \text{false}$ then the truth value of $p \text{ XOR } q$ will be _____.

False

171. If $p = \text{true}$ and $q = \text{false}$ then the truth value of $p \text{ XOR } q$ will be _____.

True

172. The set of natural number is equal to _____.

Set of positive integers

173. Let R and S be transitive relations on a set A the

Neither $R \cup S$ is transitive nor $R \cap S$ is transitive

174. If a relation $R = \{(1,2)(2,3)(3,4)(4,1)(2,2)\}$ is given then which of the following is true about this Relation.

R is antisymmetric

175. Let R be a binary relation on a set A . R is anti-symmetric iff

$\forall a, b \in A$ if $(a,b) \in R$ and $(b,a) \in R$ then $a = b$.

176. A graph of a function f is onto iff every horizontal line intersects the graph in at least one point.

True

177. A graph of a function f is onto iff every horizontal line intersects the graph in at least one point.

Graph onto function

178. A graph of a function f is one-to-one iff every horizontal line intersects the graph in at most one point.

one point

GRAPH OF ONE-TO-ONE FUNCTION:

179. A graph of a function f is bijective iff every horizontal line intersects the graph at exactly one point.

Graph of bijective function

180. $A = \{x: x \text{ is even number divisible by 6 and less than 100}\}$ is _____.

Set builder form

In venn diagram, sets are commonly represented by _____.

Circles and ovals....both

181. An infinite sequence may have only a finite number of values.

True

182. If n is even, then $C_n = 2$ and if n is odd, then $C_n = 0$. Hence, the sequence oscillates endlessly between 2 and 0.

True

183. If n is a positive integer, then $n! = n$ for $n =$

1,2

184. $n! = n(n-1)!$ for each

positive integer

185. A union $A \cup A$, A intersection $A \cap A$ are called.

Commutative law.

186. '-' is a binary operation on the set of integers $\mathbb{Z}$.

True

187. "+" and "." are binary operations on the set of natural numbers $\mathbb{N}$.

True

188. "-" is not a binary operation on $\mathbb{N}$.

True

189. Let $p = 1$ am a student, and $q = I$ love to study mathematics, then the symbolic form for the

For the statement 'I am not a student but I love to study'

$$\sim p \wedge q$$

190. A set is countably infinite if and only if, it has the same cardinality as the set

Positive integers

191. “÷” is a binary operation on the set of non-zero rational numbers $Q - \{0\}$, but not a binary operation on Z .

True

192. If a relation R is reflexive, anti symmetric and transitive then which of the following is not true for the inverse relation.

Inverse relation will be irreflexive

193. An important data type in computer programming consists

Finite sequences

194. An important data type in computer programming consists of finite sequences known as

One-dimensional arrays

195. Negation of $1 < x < B$ is _____.

$1 > x$ AND $x > 8$

196. Which of the following is true about $C_n = 1 - (-1)^n$ for all integers $n > 0$

If n is even, $C_n = 2$ and if n is odd, then $C_n = 0$

197. For any set A , the Cartesian product of A and A is known as
Universal relation

198. For any set A , $\emptyset$ is known as the

Empty relation

199. For any set A , $A \times A$ is known as the

Universal relation

200. If $F_k - 1 + F_{k-2}$ then $F_0 = 1$, $F_1 = 2$, then $F_2 =$ _____.

True

202. If f and g are two one-to-one functions, then their composition that is $g \circ f$ is one-to-one

True

203. The converse of the conditional statement if I live in Quetta, then I live in Pakistan is ____.

IF I live in Pakistan, then I Live in Quetta

204. An integer n is a product square if and only if _____ for some integer k

$$N = k^2$$

205. Inverse of a surjective function is always a function.

False

206. Inverse of a surjective function may not be a function.

True

207. If the conclusion is true when the premises are true, the argument will be ____.

Valid

208. if the conclusion is false when all the premises are true, the argument will be

invalid

209. The biconditional statement for the following statement would be ____.

The number is divisible by 6 and only if it is divisible by both 2 and 3

210. Universal bound law states that

$$P \vee \neg P$$

211. P is equivalent to q means _____.

p is necessary and sufficient for q .

212. The converse of the conditional statement, 'If I live in Lahore, then I live in Punjab' is ____.

If I live in Punjab, then I live in Lahore

213. Complementary relation symbolically written as _____.

$$R = A \times B - R = \{(a,b) \in A \times B \mid (a,b) \notin R\}$$

214. $(s \vee \sim s)$ is the _____.

Tautology

215. The statement form $p \wedge \sim p$ is a

Contradiction

216. Set difference law _____.

$$A - B = A \cap B^c$$

217. If A contains 3 elements and B contains 2 elements, then number of subsets of $A * B$ are _____.

64

218. Neither Ali is a student, nor he is from Lahore. In the logical sentences, it can be written

As _____.

$$\sim p \wedge \sim q$$

219. If a is the 1st term and d be the common difference of an arithmetic sequence Then the sequence is $a+a+d, a+2d, a+3d$.

True

220. Let A and B be subset of universal set U then the difference of A and B or $A - B =$

$$A \cup B = \{x \in U \mid x \in A \text{ or } x \in B\}$$

221. Let R be a binary relation on a set A. If R is anti symmetric then _____
Inverse of R is anti symmetric

222. Let R be a binary relation on a set A. If R symmetric then
Inverse of R is symmetric

223. Let R be a binary relation on a set A. If R is reflexive then

Inverse of R is reflexive

224. Let R be a binary relation on a set A. If R is anti transitive then

Inverse of R is transitive

225. Let $A = \{1, 2, 3, 4, 5, 6, 7, 8, 9\}$, then which of the following sets represent the partition of the set A?

$A=\{1,3,5,7,9\}$, $B=\{2,4,6\}$, $C=\{8\}$

226. Let $A=\{0,1,2\}$ and $R\{(0,2),(1,1),(2,0)\}$ be a relation on A. Then which of the following ordered pairs

Are needed to make it transitive?

$(0,0)$ and $(2,2)$

227. Elements of a set are listed in pair of brackets and separated by commas is _____.

Tabular form

228. A well defined collection of objects is called _____.

Set

229. Every set is not a proper subset of itself.

False

230. Every set is a subset of itself

True

231. Let A be subset of universal set U then double complements law is

$(A^c)^c = A$

232. The relation divides on the set of integers is _____.

An anti symmetric relation

233. For any set A , $A \times A$ is known as

Universal set

234. For any set A, $\emptyset$ is known as the

Empty relation

235. The logical statement $p \wedge q$ means _____.

P AND q

236. Which of the logical expressions represents the sentence ' if you read stories, then your vocabulary

Will increase and conversely?

$p \rightarrow q$

237. Vertical line test is used to determine that whether the graph of a relation is a

Function or not.

True

238. The set Z all integers is countable

True

239. Number of one to one functions from $X=\{a,b\}$ to $Y=\{u,v\}$ are equal to
2

240. $P \leftrightarrow q$ is true when _____.
P is false, q is false

241. The set of all vowels in the english alphabet
 $V=\{a,e,i,o,u\}$ is _____.

Tabular and descriptive form....both

242. Let R be a relation from a set A to a set B and S a relation from B to a set C. The composite of R and S denoted $S \circ R$ is the relation from A to C, consisting of ordered pairs (a,c) where $a \in A$, $c \in C$, and for which there exists an element $b \in B$ such that $(a,b) \in R$ and $(b,c) \in S$. Symbolically

$$S \circ R = \{(a,c) | a \in A, c \in C, \exists b \in B, (a,b) \in R \text{ and } (b,c) \in S\}$$

243. Let $A=\{1,2,3\}$ and $B=\{0,1,2\}$ and $C=\{a,b\}$
 $R=\{1,0\},\{1,2\},\{3,1\},\{3,2\}$
 $S=\{0,b\},\{1,a\},\{2,b\}$
Composite of R and S= _____.

$$\{1,a\},\{1,b\},\{2,a\},\{3,b\}$$

244. $A \cap B =$

An integer n is even if, and only if, $n = 2k$ for some integer k.

True

2. An integer n is odd if, and only if, $n = 2k + 1$ for some integer k.

True

3. An integer n is prime if, and only if, $n > 1$ and for all positive integers r and s, if $n = r \cdot s$, then $r = 1$ or $s = 1$.

True

4. An integer $n > 1$ is composite if, and only if, $n = r \cdot s$ for some positive integers r and s with $r \neq 1$ and $s \neq 1$.

True

5. A real number r is rational if, and only if, a/b for some integers a and b with $b \neq 0$.

True

6. If n and d are integers and $d \neq 0$, then d divides n, written $d | n$ if, and only if,
 $n = d \cdot k$ for some integer k.

True

7. An integer n is called a perfect square if, and only if, $n = k^2$ for some integer k .

True

245. $A \cap B =$

$$\{x \in U \mid x \in A \text{ and } x \in B\}$$

246. A set may be divided up into disjoint subsets, such division is called.

Partition

247. Let R be a binary relation defined on a set A . R is a partial order relation, if and only if, R is reflexive, antisymmetric, and transitive. The set A together with a partial ordering R is

Partially order relation

248. Let A and B be subsets of a universal set U . The difference of “ A and B ” (or relative complement of B in A) is the set of all elements in U that belong to A but not to B , and is denoted $A - B$ or $A \setminus B$.

Difference

249. Let A and B be subsets of a universal set U . The difference of “ A and B ” (or relative complement of B in A) is the set of all elements in U that belong to A but not to B , and is denoted $A - B$ or $A \setminus B$.
symbolically

$$A - B = \{x \in U \mid x \in A \text{ and } x \notin B\}$$

250. Let A and B subsets of a universal set U . The intersection of sets A and B is the set of all elements in U that belong to both A and B and is denoted $A \cap B$.

Intersection

251. Let A and B subsets of a universal set U . The intersection of sets A and B is the set of all elements in U that belong to both A and B and is denoted $A \cap B$. symbolically

$$A \cap B = \{x \in U \mid x \in A \text{ and } x \in B\}$$

252. a set A is the set of all subsets of A , denoted $P(A)$.

power set

253. If A has n elements then $P(A)$ has

2^n elements

254. Every set can be represented in tabular form

True

255. $\sim p$ is true when _____.

P is False

256. Negation of $2 < x < 3$ is _____.

$2 > x$ Or $x > 3$ (not sure)

257. The negation of an AND statement is logically equivalent to the OR statement in which each component is negated.

$$\sim (p \wedge q) \equiv \sim p \vee \sim q$$

258. The negation of an OR statement is logically equivalent to the AND statement in which each component is negated.

$$\sim (p \vee q) \equiv \sim p \wedge \sim q$$

259. A function $f: \mathbb{R} \rightarrow \mathbb{R}$ defined by $f(x) = \text{square root}(x)$ is a real valued function

False

260. $f: \mathbb{R}^+ \rightarrow \mathbb{R}$ defined by $f(x) = \log x$ is a real valued function

true

261. $g: \mathbb{R} \rightarrow \mathbb{R}$ defined by $g(x) = e^x$ is a real valued function of a real variable.

True

262. Let f and g be real valued functions with the same domain X . That is $f: X \rightarrow \mathbb{R}$ and $g: X \rightarrow \mathbb{R}$.

Sum of function

263. The sum of f and g denoted by $f+g$ is a real valued function with the same domain X i.e. $f+g: X \rightarrow \mathbb{R}$ defined by

$$(f+g)(x) = f(x) + g(x) \quad \forall x \in X$$

264. The matrix representation of an inverse relation can be obtained taking the ____ of the relational
Matrix

Inverse

265. Let R be a relation from A to B . The inverse relation R^{-1} from B to A is defined as:

Inverse relation

266. Let R be a relation from A to B . The inverse relation R^{-1} from B to A is defined as:

$$R^{-1} = \{(b, a) \in B \times A \mid (a, b) \in R\}$$

267. In the directed graph of an antisymmetric relation there is _____ pair of arrows between two

Distinct elements of the set

No

268. For any set A, the Cartesian product of A and A is known as _____.

Universal relation

269. A function whose range consists of only one element is called _____.

Constant function

270. In the matrix representation of an irreflexive relation all the entries in the Main diagonal are _____.

0

271. A function whose inverse function exists is called an
Invertible function

272. A sequence is a function whose domain is the set of integers greater than or equal to a particular integer n_0

Formal

273. We use the notation a_n to denote the image of the integer n , and call it a term of the sequence

Notation

274. If f and g are two one-to-one functions, then their composition $g \circ f$ is

One to one function

275. If $f: X \rightarrow Y$ and $g: Y \rightarrow Z$ are both onto functions, then $g \circ f: X \rightarrow Z$ is

Onto

276. A graph of a function f is onto iff every horizontal line intersects the graph in at least

One point

277. Let A and B subset of universal set U then $(A \cup B)^c =$

$A^c \cap B^c$

CORRECT FILE

Arithmetic sequence

2. composition of a function is commutative operation False

3. real valued function is a function that assign----- to each number of its domain

real number

4. let X equal 1 2 3 4 and a function f depend on X by f into 1
equal 1
 f into 2 equals to 2
 f into 3 equal 3 and
 F into 4 equal 4
Then-----

F is an identity function

5. a constant function is Injective if and only if-----

the codomain consists of a single element

6. let $f: \mathbb{R} \rightarrow \mathbb{R}$ is one to one function then c, f, c does not equal to zero is also, one to one function

True

7. if f and G are two one to one function then their composition that is $g \circ f$ is one to one

True

8. let $f(x) = 3x$ and $g(x) = x + 2$ define function f and G from $\mathbb{R}$ to $\mathbb{R}$ then $f \circ g(x)$ is-----

$$\underline{3x^2 + 6x}$$

9. the set $\mathbb{Z}$ of all integers is countable

True

10. 0.818181 is an infinite geometric series

True

11. which of the following is not correct for a sequence?

A sequence is a relation whose domain is the set of natural numbers

12. $f(x) = x^2$ is not one to one function from $\mathbb{R}$ to $\mathbb{R}$ True

13. let $f: \mathbb{R} \rightarrow \mathbb{R}$ equal $f(x) = x + 2$ then $f^{-1}: \mathbb{R} \rightarrow \mathbb{R}$ is

$$\underline{x - 2}$$

14. let $f: \mathbb{R} \rightarrow \mathbb{R}$ equal $f(x) = x^2 + 1$ define function f from $\mathbb{R}$ to $\mathbb{R}$ and $C = 2$ to be any scalar then $c, f(x)$ is-----

$$\underline{2x^2 + 2}$$

15. one to one correspondence means the condition of both a
and c

16. Term of a geometric sequence is 2 and common ratio is $\frac{1}{2}$ then third term of a sequence is

$$\underline{\frac{1}{2}}$$

17. the process of defining an object in terms of smaller version of itself is called recursion

True

18. a set is called countable if and only if it is

(d) (b) (c)

19. A sequence whose terms alternate in sign is called an----

alternating sequence

20. let f and G be two functions Defined by $f(x) = x + 2$ and $g(x) = x + 1$ then the composition of f and G is-----

$2x + 3$

21. number of one-to-one functions from $X = \{a, b\}$ to $Y = \{u, v\}$ are equal to-----

2

22. an important data type in computer programming consists of -----

finite sequence

23. if a function is recursively defined as $F(0) = 4$ & $f(n + 1) = 3f(n)$ then $f(1) =$ -----

15

24. inverse of a function may not be a function

True

25. if a function is recursively defined as $F(0) = -1$ & $f(n + 1) = f(n) + 3$, then $f(1) =$ -----

2

26. The function f and G are inverse of each other if and only if their composition gives-----

identity function

27. which of the following state is a domain of a sequence ----

set of natural number

28. Let f and g be two functions defined by $f(x) = x + 2$ and $g(x) = 2x + 1$. Then the composition of f and g

$2x + 5$

29. Let $R = \{(1,2), (3,4), (5,6), (7,8)\}$. Range of the inverse of the relation is -

$\{1,3,5,7\}$

30. The set Z of all integers is countable.

True

31. In the representation of an irreflexive relation using a matrix, all its diagonal entries will be -----

0

32. Let $p =$ I am hard working. $Q =$ I am intelligent. Then $p \wedge q$ means ----

I am NOT hard working BUT I am intelligent.

33. If a set A contains n elements then the number of elements in its power set P(A) is-----

$$\underline{2^n}$$

34. Which of the following is true for the following sequence? $C_n = 1 - (-1)^n$ for all integers $n > 0$

If n is even, then $C_n = 0$ and if n odd, then $C_n = 2$

35. Let $A = \{1, 2, 3, 4\}$ and $R = \{(1, 1) (2, 2) (3, 3) (4, 4)\}$ then R is

Options a, b and c all true

36. If $A - B = A$, which of the following statement is true? All of the given statements are false

37. If $A = \{1, 2, 3\}$ is a set and $R = \{(1, 2) (2, 2) (2, 1)\}$ is a relation on A. R is Symmetric

38. The converse of the conditional statement 'If I live in Lahore, then I live in Punjab' is -----

If I live in Punjab, then I live in Lahore

39. Every set can be represented in tabular form.

False

40. The function defined from $\mathbb{Z}$ to $\mathbb{Z}$ as $f(x) = 1 / (x + 2)(x - 2)$ is not well defined because-----

Function is not defined at $x = -2$ and $x = 2$

41. Which of the following is always true for the matrix representation of asymmetric relation?

Matrix is equal to its transpose

42. Associative law of union for three sets is-----

$A \cup (B \cup C) = (A \cup B) \cup C$

43. If f is bijective function then $(f^{-1}(f(x)))$ is equal to -----

x

44. $P \leftrightarrow Q$ is logically equivalent to -----

$(p \rightarrow q)$

45. Let $A = \{0, 1, 2\}$ and $R = \{(0, 2), (1, 1), (2, 0)\}$ be a relation on A . Then which of the following ordered pairs are needed to make it reflexive.

$(0, 0)$ and $(2, 2)$

46. Let A be subset of universal set U then $A \cup A^c = \underline{\Phi}$

47. Let R be a binary relation on a set A . if R is anti-symmetric then -----

Inverse of R is anti-symmetric

48. The inverse of statement 'if it is pleasant outside, then I go to the park' is -----

If it is NOT pleasant outside, then I do NOT go to the park.

49. The inverse of the statement 'if it is hot day, then I am at home' is -----

if it is NOT hot day, then I am NOT at home

50. Let A, B, C be subset of universal set U then the idempotent law is -----

$A \cap A = A$

51. Let A and B be subset of universal set U then $A - (A - B) = \underline{A \cap B}$

52. Real valued function is a function that assigns -----to each member of its domain.

Only a real number

53. Let R be a relation on set A, if R is reflexive then its complement is -----

Irreflexive

54. Range of function $f(x) = \{e^x\}$ is -----

Set of positive Real numbers

55. Composite relation symbolically written as -----

$SoR = \{(a,c) | a \in A, c \in C, \exists b \in B, (a,b) \in R \text{ and } (b,c) \in S\}$

56. If $x \equiv 17 \pmod{5}$ which of the following integers are valid solution for x? 12

57. Operation of subtraction is a binary operation on the set of -----

Integers

58. Range of relation $\{(0, 10), (3, 22), (90, 34)\}$ is -----

$\{10, 22, 34\}$

59. Let $S = R$ and the “square” relation $R = \{(x, y) | x^2 = y^2\}$. The square relation is an ----- relation.

Equivalence relation

60. The logic gate NOT is a unary operation on $\{0, 1\}$ True

61. Let $A = \{1, 2\}$, then $P(A) = \text{-----}$

$\{\}, \{1\}, \{2\}, \{1, 2\}$

62. If a relation R is reflexive, anti symmetric and transitive then which of the following is not true for the inverse relation.

Inverse relation will be irreflexive.

63. Let R be a binary relation on a set A . R is anti-symmetric iff -----

$a, b \in A$ if $(a, b) \in R$ and $(b, a) \in R$ then $a = b$

64. the inverse relation R^{-1} from B to A is defined as -----

$R^{-1} = \{(b, a) \in B \times A \mid (a, b) \in R\}$

65. Which of the following is true for the matrix representation of asymmetric relation?

Matrix is equal to its transpose

66. If $x \equiv -10 \pmod{15}$ which of the following integers are valid solutions for x ?
5

67. Let $A = \{0, 1\}$ and $B = \{1\}$. Let R and S be two binary relations on the Cartesian product of A and B such that $R = \{(0, 1)\}$ and $S = \{(1, 1)\}$

Then $R \cap S =$ -----

Empty

68. The domain of a relation R from A to B is symbolically written as: $D(R) = \{a \in A \mid \exists b \in B, (a, b) \in R\}$

69. Which of the following is not a type of a relation?

Permutation

70. Let $A = \{4, 5, 6\}$ then the relation $R = \{(4, 5), (5, 4), (6, 5), (5, 6)\}$ is -----

R is symmetric

71. Let $A = \{1, 2, 3\}$ and $B = \{0, 1, 2\}$ and $C = \{a, b\}$

$R = \{(1, 0), (1, 2), (3, 1), (3, 2)\}$

$S = \{(0, b), (1, a), (2, b)\}$

Composite of R and $S =$ -----

$\{(1, b), (3, a), (3, b)\}$

72. If A contain 3 elements and B contain 2 elements, then number of subsets of $A * B$ are -----

64

73. Let $A = \{1,2,3,4\}$ and define the following relations on A then $R = \{(1,3)(1,4) (2,3 (2,4) (3,1) (3,4)\}$ is -----

R is irreflexive

74. Let $X = \{2,4,5\}$ and $Y = \{1,2,3\}$ and R be a relation from X to Y defined by $R = \{(2,4) (4,1) (a,2)\}$. for what value of 'a' the relation R is a function?

5

75. A function whose range consists of only one element is called _____

One to one function

76. The set Z of all integers is _____

Countable

77. One-to-one correspondence means the condition of _____

Both (a) and (c)

78. Let $X = \{1,5,9\}$ and $Y = \{3,4,7\}$, Define a function f from X to Y such that

$f(1)=7, f(5)=3, f(9)=$ _____. Which is true f(9) to make it a one-to-one (injective) function?

4

79. What will be the fourth term of the following sequence $1/2, 2/3, 3/4$
_____?

$4/5$

80. The value of $6!$ =

720

81. A constant function is one to one iff its _____ is a singleton.

Domain

82. A constant function is onto iff its _____ is a singleton. Co-domain

Number of one to one functions from $X=\{a,b\}$ to $Y=\{u,v\}$ are equal to _____ -

2

83. If f is defined recursively by $f(0) = -1$ and $f(n+1)=f(n)+3$, then $f(2)=$ ____.

5

84. A function whose inverse function exists is called a/an _____

Invertible function

85. Let $f(2)=3$, $g(2)=3$, $f(4)=1$ and $g(4)=2$ then the value of $f \circ g(4)$ is.....3

86. Let $A=\{1,2,3,4\}$ and $B=\{7\}$ then the constant function from A to B is

_____.

Onto

87. Composition of a function is a commutative operation.

False

88. Composition of a function is not a commutative operation True

89. The sum of first five whole number is_____.

10

90. If f and g are two one-to-one functions, then their composition that is $g \circ f$ is one-to-one.

True

91. Inverse of a surjective function is always a function.

False

92. Inverse of a surjective function may not be a function True

93. Let $X=\{1,2,3,4\}$ and $Y=\{7,8,9\}$ and let f be function defined from X to Y such that f is onto then which of the following statement about f is true?

Co-domain of f must contain 3 elements

94. If $f; X \rightarrow Y$ and $g; Y \rightarrow Z$ are both onto functions. Then $g \circ f; X \rightarrow Z$ is

onto

95. If f and g are two one-to-one functions, then their composition $g \circ f$ is__

One-to-one

96. If $f: W \rightarrow X$, $g: X \rightarrow Y$, and $h: Y \rightarrow Z$ are functions, then _____
($h \circ g$) $\circ f = h \circ (g \circ f)$

97. Cardinality of positive prime numbers less than 20 is _____.

8

98. If $f(x) = \sin^{-1}(x)$ and $g(x) = \sin x$ then $g \circ f(x)$ is _____.

x

99. $0! =$ _____.

1

100. An important data type in computer programming consists of

_____.

Finite sequences

101. Let $f(x) = 2x$ and $g(x) = x + 2$ define functions f and g from R to R , then $(f \circ g)(x)$ is

_____.

$x-2$

102. The total number of terms in an arithmetic series
 $0+5+10+15+....50$ are_____.

11

103. $9!/6!=$ _____

504

104. Let $f(x)=3x$ and $g(x)=3x-2$ define functions f and g from $\mathbb{R}$ to $\mathbb{R}$, THEN
 $(F+G)(X)$ is

$6x-2$

105. If f is a bijective function then $(f^{-1}f(x))$ is equal to

x

106. A sequence whose terms alternate in sign is called an_____
Alternating sequence

107. Common ration in the sequence “4, 16, 64, 256,...” is.....12.

4

108. 0.8181818181 is a infinite geometric series.True

109. The word 'algorithm' refers to a step-by-step method for performing some action.

True

110. A predicate become _____ when its variables are given specific values

Sentence

111. The sum of two irrational numbers must be an irrational number. False

112. The sum of two irrational numbers need not be irrational number True

113. The division by zero is allowed in mathematics. False

114. The product of any two consecutive positive integers is divisible by 2

True

115. If 'n' is an odd integer then $n^3 + n$ is _____.

Even

116. For integers a, b, c, If a divides b and a divides c, then a divides (a+b).

False

117. Quotient remainder theorem states that for any positive integer d , there exist unique integer q and r such that _____ and $0 < r < d$

$$N = d \cdot q + r$$

118. A rule that assigns a numerical value to each outcome in a simple space is called

Random variable

119. If A and B are two disjoint (mutually exclusive) events then $P(A \cap B) =$
 $P(A) + P(B)$

120. How many ways are there to select five players from a 10 member tennis team to make a trip to a match to another school?

$$C(10, 5)$$

The expectation of x is equal to

$$\sum x f(x)$$

121. If $P(A \cap B) = P(A) P(B)$ THEN THE events A and B are called
Independent

122. A walk that starts and ends at the same vertex is called.

None optins

123. How many integers from 1 through 1000 are neither multiple of 3 nor multiple of 5

497

124. What is the probability of getting a number greater than 4 when adie is thrown?

3/5

125. Eater formula for graphs is_____.

$F=e-v+2$

126. $X+a, x+3a, x+5a, \dots$ is an_____

Arithmetic sequence

127. Composition of a function is a commutative operation.False

128. Real valued function is a function that assigns_____to each member of its domain.

Only a real number

129. Let $X=\{1,2,3,4\}$ and a function 'f' defined on X
 $f(1)=1, f(2)=2, f(3)=3, f(4)=4$ then _____

F is an identity function

130. A constant function is surjective if and only if _____

The co-domain consists of a single element

131. Cardinality means the total number of elements in a set. True

132. If $f(x)=2x$ and $g(x)=x$ then $g(f(x))$ is _____.

2x2

133. Let $f: \mathbb{R} \rightarrow \mathbb{R}$ is one to one function then c, f, c is not equal 0 is also one to one function.

True

134. Let $X=\{1,2,3,4\}$ and a function 'f' defined from X to X by $f(1)=1, f(2)=1, f(3)=1, f(4)=1$

then which of the following is true? F is a
constant function

135. If f and g are two one-to-one functions, then their composition that is $g \circ f$ is one-to-one.

True

136. Which of the following is not correct for a 'sequence'? A

sequence is a relation whose domain is the set of natural numbers

137. $F(x)=x^2$ is not one to one function from $\mathbb{R}$ to $\mathbb{R}^+$

True

138. Let $f: \mathbb{R} \rightarrow \mathbb{R}$ is one to one function then $c, f \circ c$ is not equal to c is also one to one function.

True

139. Let $f(x) = x + 2$ then $f^{-1}(x)$ is _____
 $x - 2$

140. Let $f(x) = x^2 + 1$ define functions f from $\mathbb{R}$ to $\mathbb{R}$ and $c = 2$ be any scalar, then $c, f(x)$ is _____.
 $2x^2$

141. One to one correspondence means the condition of _____.
Both (a) and (c)

142. A function $F: \mathbb{R} \rightarrow \mathbb{R}$ defined by $f(x) = \text{square root } x$ is a real valued function.
False

143. If $g: \mathbb{R} \rightarrow \mathbb{R}$ defined by $g(x) = e^2$ is a real valued function of a real variable. True

144. A function $F: \mathbb{R} \rightarrow \mathbb{R}$ defined by $f(x) = \log x$ is a real valued function

True

145. $\frac{1}{2}$, then 3rd term of sequence is _____.
 $\frac{1}{2}$

146. The process of defining an object in terms of smaller versions of itself is called recursion.

True

147. Which of the following is not correct for a 'sequence'? A sequence is a relation whose domain is the set of natural numbers

148. A set is called countable if, and only if, it is _____.
Finite and countable infinite.....
both

149. A set that is not countable is called _____.
Uncountable

150. A sequence whose terms alternate in sign is called an _____.
Alternating sequence

151. Let $f: \mathbb{R} \rightarrow \mathbb{R}$ is one to one function then $c \cdot f$ is also one to one function for ____.

C is not equal 0

152. Let $f(x) = x+3$ then $f^{-1}(x)$ is _____ -
 $x-3$

153. Let f and g be two functions defined by $f(x) = x+2$ and $g(x) = 2x+1$.
Then the
composition of f and g is _____.
 $2x+3$

154. Number of one to one functions form $X=\{a,b\}$ to $Y=\{u,v\}$ are equal to _

2

155. The fibonacci sequence is deined as $F_0=1, F_1=1, F_k=F_{k-1}+F_{k-2}$ for all
integers $k > 2$ then which of the following is true for F_2
 $F_2-F_1 = 2+1=3$

156. $x+a, x+3a, x+5, a, \dots$ is a/an _____.
Arithmetic sequence

157. Inverse of a function may not be a function. True

158. In the following sequence $a_k = K/(k+1)$, for $k=1$, a_1 will be
_____.
 $\frac{1}{2}$

159. If $f(x)=x$ and $g(x)= -x$ are both one to one function then $(f+g)(x)$ is also one to one function.

False

160. If $f(x)=x$ and $g(x)= -x$ are both one to one function then $(f+g)(x)$ is not one to one function.

True

161. The function 'f' and 'g' are inverse of each other if and only if their composition gives _____.

Identity function

162. Which of the following set is the domain of a sequence? Set of real numbers

163. Let C is defined as the set of all countries in the world then C is a _____.

Finite set

164. A constant function is surjective if and only if _____.
The co domain consists of a single element

165. Inverse of a function may not be a function. True

166. Let $X=\{1,2,3,4\}$ and a function 'f' defined from X to X by $f(1)=1, f(2)=1, f(3)=1, f(4)=1$ then which of the following is true?

F is a constant function

167. The composition of function is always

Associative

168. A set is countably infinite if, and only if, it has the same cardinality as the set of -----

Positive integers

169. Two functions 'f' and 'g' from 'X' to 'Y' are said to be equal if and only if ____.

$F(x)=g(x)$ for all 'x' belongs to X

170. $Y=x^3$ is a graph of bijective function from $\mathbf{R}$ to $\mathbf{R}$. True

171. Domain and range are same for _____.

Identity function

172. Let $X=\{1,2,3,4\}$ and a function 'f' defined on X by $f(1)=1, f(2)=2, f(3)=3$

F is an identity function

173. Composition of a function is a commutative operation. True

174. Inverse of a surjective function is always a function. False

175. A function whose inverse function exists is called a/an _____.

Invertible

176. Given a set X define a function I from X to X by $i(x)=x$ from all x belonging to X . Then _____.

I is both injective and surjective

177. Let $f: \mathbb{R} \rightarrow \mathbb{R}$ is a one to one function then c, f is also one to one function for.

C is not equal 0

178. Let $X=\{1,5,9\}$ and $Y=\{3,4,7\}$. Define a function f from X to Y such that $f(1)=7, f(5)=3, f(9)=$ _____. Which is true for $f(9)$ to make it a one-to-one (injective) function?

4

179. Which of the following is not a predecessors of a_k ? A_{k+1}

180. Two functions ' f ' and ' g ' from X to Y are said to be equal if and only if _____.

$F(x)=g(x)$ for all 'x' belongs to x

181. The two functions 'f' and 'g' are equal if _____.

$F(x) = 3x$ and $g(x) = 6x^2 + 3x/2x^2 + 1$ for all $x \in \mathbb{R}$

182. If first term of a geometric sequence is 2 and common ratio is $\frac{1}{2}$, then-----
3rd ter, of sequence. $\frac{1}{4}$

183. $Y = \text{squire root } x$ is an _____ function form $\mathbb{R}^+$ to $\mathbb{R}$

One to one function

184. $Y = x^2$ is an _____ function form $\mathbb{R}$ to $\mathbb{R}^+$

NOT ONE TO ONE FUNTION

185. If a function $(g \circ f)(x) : X \rightarrow Z$ is defined as $(g \circ f)(x) = g(f(x))$ for all $x \in X$, Then
the
function -----.

$(g \circ f)$

186. If 0 is the first term and -2 be the common difference of an arithmetic
series, then the sum of first five terms of series is _____.
-20

187. If $f(x) = \sin^{-1}(x)$ and $g(x) = \sin x$ then $g \circ f(x)$ is _____.
X

188. $f: X \rightarrow Y$ that is both one to one and onto is called a _____.

Bijjective function

189. What does 'r' denotes in a geometric sequence?

Common ratio

190. Let g be a function defined by $g(x)=x+1$. Then the composition of $(g \circ g)$. X
 $2+2x+1$

191. A graph of a function f is one to one iff every horizontal line intersects the graph in at most one point.

True

192. Which of the following is true for the following sequence? If n is even, then $C_n=2$ and if n is odd, then $C_n = 0$

193. The function ' f ' and ' g ' are inverse of each other if and only if their composition gives _____.

Identity function

194. $n!$ is defined to be _____.

The product of the integers from 1 to n

195. Let $A = \{1,2,3,4\}$ and $B=\{7\}$ then the constant function from A to B

Both one to one and onto

196. A set is called countable if, and only if, it is _____.

Countably infinite and finite

197. If $f(x) = x$ and $g(x) = -x$ are both one to one functions then $(f+g)(x)$ is also one to one function.

False

198. If a is the 1st term and d be the common difference of an arithmetic sequence

then the sequence is $a, a+d, a+2d, a+3d, \dots$. True

199. $x+a, x+3a, x+5, \dots$ is a/a_n _____.

Arithmetic sequence

200. inverse of an injective function may not be a function. True

201. $y=x^3$ is a graph of bijective function from $\mathbb{R}$ to $\mathbb{R}$. False

202. Two functions 'f' and 'g' from x to y are said to be equal if and only if,
 $f(x)=g(x)$ for all 'x' belongs to x

203. Common ratio in sequence '36, 12, 4, 4/3, ...' is 1/3

204. A set is called finite if, and only if, is the _____ or there is -----
-.

Empty set or one-to-one

205. Let $f(x)=x^2-1$ and $g(x)=x+1$ define functions f and g from R to R, then $(f/g)x$
 $x-1$

206. A graph of a function f is one to one iff every horizontal line intersects
the
graph in at most one point.

True

207. Let g be a function defined by $g(x) = x+1$. Then the composition of (gog).
 x^2+2x+1

208. $f:X \rightarrow Y$ that is both one to one and onto is called a _____.
Bijective function

209. What does 'r' denotes in a geometric sequence?

Common ratio

210. Let $A=\{1,2,3,4\}$ and $B=\{7\}$ then the constant function from A to B is ____.

Both one to one and onto

211. $n!$ is defined to be _____.

The product of the integers from 1 to n

212. A set is called countable if, and only if, it is _____. Both b and c

213. Which of the following is the example of an alternating sequence? $C_n = n/n+1$ for $n > 0$

214 $x+a, x+3a, x+5a, \dots$ is an _____.

Arithmetic sequence

215 $0, -5, -10, -15, \dots$ is an _____.

Arithmetic sequence

225. $5, 9, 13, 17, \dots$ is an _____.

Arithmetic sequence

226. An important data type in computer programming consists of
_. Finite sequence

227. One-to-one correspondence means the condition of_____.

One-one and onto both

228. Cardinality means the total number of elements in a set.True

229. Inverse of a function may not be a function.True

230. The functions 'f' and 'g' are inverse of each other if and only if their
composition gives_____.

Identity function

231. A set is called finite if , and only if, it is the_____or there is
_____.

Empty set or one-to-one

232. Let f and g be the two functions from R to R defined by $f(x) = |x|$ and $g(x) =$
square root x^2 for all $x \in R$, then_____.

F(x) is not equal to g(x)

234. If $f^{-1}(x) = 6 - x/2$ then $f^{-1}(2)$ is _____.

2

235. Let $f(2)=3$, $g(2)=3$, $f(4)=1$ and $g(4)=2$ then the value of $f \circ g(4)$ is _____.

3

236. An important data type in computer programming consists of _----- _.

Finite sequence

237. Let $f(x)=x+3$ then f^{-1}

(x) is _____.

$x-3$

238. If $f: X \rightarrow Y$ and $g: Y \rightarrow Z$ are both onto function. Then $g \circ f: X \rightarrow Z$ is

_____.

One-to-one function

239. The functions 'f' and 'g' are inverse of each other if and only if their composition gives

Identity function

240. The two function 'f' and 'g' are equal if _____.

$F(x) = 3x$ and $g(x) = 6x^2 + 3x/2x + 1$ for all $x \in \mathbb{R}$

241, Two functions 'f' and 'g' from X To Y are said to be equal if and only if--
----.

$F(x)$ and $g(x)$ for all 'x' belongs to X

242 Which of the following set is the domain of a sequence? Set of natural numbers

243 If 1st term of a geometric sequence is 2 and common ratio is $\frac{1}{2}$, then 3rd term of sequence is_____.

$\frac{1}{2}$

244 Composition of a function is a commutative operation. True

245 If a function $(g \circ f)(x): X \rightarrow Z$ is defined as $(g \circ f)(x) = g(f(x))$ for all $x \in X$. Then the

function_____is known as composition of f and g. ($g \circ f$)

246 A set is countably infinite if and only if, it has the same cardinality as the set of_____.

Positive integers

247 The 3rd term of the sequence $b_n = 5n$ is_____

125

248 If f is a bijective function then $(f^{-1})(f(x))$ is equal to_____.

x

249 Let $f(x) = x$ and $g(x) = -x$ for all $x \in \mathbb{R}$, then $(f+g)(x)$ is _____.

0

250 An infinite sequence may have only a finite number of values. True

251 The functions $f \circ g$ and $g \circ f$ are always equal. False

252 If f and g are two one-to-one functions, then their composition that is $g \circ f$ is one-to-one.

True

253 A function whose range consists of only one element is called
.. Constant function

254 Let $X = \{1, 5, 9\}$ and $Y = \{3, 4, 7\}$. Define a function f from X to Y such that $f(1)=7$, $f(5)=3$, $f(9)=4$ then which of the following statement about ' f ' is true? f is both one-to-one and onto

255 $Y=x^3$ is a graph of bijective function from $\mathbb{R}$ to $\mathbb{R}$. True

256 A function whose inverse function exists is called a/an_____.

Invertible

257 Let f and g be two functions defined by $f(x) = x+2$ and $g(x) = 2x+1$. Then the composition of f and g is_____.

$2x + 5$

257 If r is a positive real number, then the value of r in $3, r, r = -27r$ is None
options

258 The_____of the terms of a sequence forms a series. Sum

259 The sum of first five whole number is_____.

10

260 If $f_k = f_{k-1} + f_{k-2}$ then $f_0 = 1, f_1 = 2$, then $f_2 =$ _____.

3

261 Range of function $\{f(x) = \{e^x\}\}$ is -----

Set of positive Real numbers

262 Composite relation symbolically written as -----

$SoR = \{(a,c) | a \in A, c \in C, \exists b \in B, (A,B) \in R \text{ and } (b,c) \in S\}$

Q63 If $x \equiv 17 \pmod{5}$ which of the following integers are valid solution for x?12

Q64 Operation of subtraction is a binary operation on the set of -----
integers

Q65 Range of relation $\{(0, 10), (3, 22), (90, 34)\}$ is -----
 $\{1, 22, 34\}$

Quiz 1 updated 2021

1. Range of function $f(x) = (e^x)$ is _____

Set of positive real numbers

2. Composite relation symbolically written as _____

$S \circ R = \{(a, c) \mid a \in A, c \in C, \exists b \in B, (a, b) \in R \text{ and } (b, c) \in S\}$

3. If $x \equiv 17 \pmod{5}$ which of the following integers are valid solution for x ?

12

4. Range of the relation $\{(0,1), (3,22), (90,34)\}$

$\{1, 22, 34\}$

5. Let $A = \{0, 1, 2\}$ and $R = \{(0,2), (1,1), (2,0)\}$ be a relation on A . The which of the following ordered pairs are needed to make it transitive?

$(0,0)$ and $(2,2)$

6. Operation of subtraction is a binary operation on the set of _____

Integers

7. Let $S = R$ and define the 'square' relation $R = \{(x, y) \mid x^2 = y^2\}$. The square relation is an _____ relation

Equivalence relation

8. The logic gate NOT is a unary operation on $\{0, 1\}$.

True

9. Let $A = \{1, 2\}$, then $P(A) =$ _____

$\{\{\}, \{1\}, \{2\}, \{1, 2\}\}$

10. If a relation R is reflexive, anti symmetric and transitive then which of the following is not true for the inverse relation.

Inverse relation will be irreflexive.

11. Let R be a binary relation on a set A , R is anti-symmetric iff _____

$a, b \in A$ if $(a, b) \in R$ and $(b, a) \in R$ then $a = b$

12. " $-$ " is a binary operation on the set of integers Z .

True

13. The inverse relation R^{-1} from B to A is defined as _____

$R^{-1} = \{(b,a) \in B \times A \mid (a,b) \in R\}$

14. Which of the following is always true for the matrix representation of a symmetric relation?

Matrix is equal to its transpose

15. Let $A = \{1,2,3,4\}$ and let R and S be transitive binary relations on A defined as; $R = \{(1,2), (1,3), (2,2), (3,3), (4,2), (4,3)\}$ and $S = \{(2,1), (2,4), (3,3)\}$ then $R \cup S = \{(1,2), (1,3), (2,1), (2,2), (2,4), (3,3), (4,2), (4,3)\}$

R union S is transitive

16. Let $S=R$ and define the 'square' relation $R = \{(x,y) \mid x^2 = y^2\}$. The square is an _____ relation.

Equivalence relation

17. If $x \equiv -10 \pmod{15}$. Which of the following integers are valid solution for x?

5

18. Let R be a binary relation on a set A. If R is anti symmetric then _____

Inverse of R is anti symmetric

19. If $A = \{1,2,3\}$ is a set and $R = \{(1,2), (2,2), (2,1)\}$ is a relation on A, R is

Symmetric

20. Let $A = \{0,1\}$ and $B = \{1\}$. Let R and S be two binary relations on Cartesian product of A and B such that $R = \{(0,1)\}$ and $S = \{(1,1)\}$. Then $R \cap S =$ _____

Empty

21. A relation R is said to be _____ iff it is reflexive, antisymmetric and transitive.

Partial order Relation

22. Let $X = \{1,2,3\}$ and $Y = \{7,8,9\}$ and let f be function defined from X to Y such that f is onto then which of the following statement about f is true?

Co-domain of f must contain 1 element

23. The function $f \circ g$ and $g \circ f$ are always equal

False

24. If a relation $R = \{(1,2), (2,3), (3,4), (4,1), (2,2)\}$ is given then which of the following is true about this relation

R is reflexive

25. A set is called countable if , and only if, it is _____

(a) finite

26. Let $f(x) = x^2 - 1$ define function f from R to R and $c=2$ be any scalar, then $c \cdot f(x)$ is _____

$2x^2 - 2$

27. The set Z of all integers is _____

Countable

28. Let R be a binary relation on a set A. If R is anti symmetric then _____

Inverse of R is symmetric

29. For $(2x-3, 4y+2) = (1,10)$. What will be the value of x and y ?

(2,2)

30. Let f and g be the two functions from R to R defined by $f(x) = |x|$ and $g(x) = \text{square root of } x^2$ for all $x \in R$. Then _____

$f(x)$ is not equal to $g(x)$

31. If a set A has 15 elements then $P(A)$ (power set of A) has _____ elements.

2^{15}

32. For the relation below to be a function, x cannot be what values $\{(12,14), (13,5), (-2,7), (x,13)\}$?

X cannot be 12, 13, or -2

33. Let the set $A = \{1,2,3,4\}$. Then the relation $\{(2,4), (4,2)\}$ is _____

Symmetric

34. For the following relation to be a function, x can not be what values? $R=\{(2,4),(x,1), (4,2),(5,6)\}$.

x cannot be 2,4 and 5

35. Vertical line test is used to determine that whether the graph of a relation is a function or not.

True

36. The properties of being symmetric and being anti symmetric are _____

Not negative of each other

37. The number of elements in $A \times B$ are _____ if A is a set with '5' elements and B is a set with '4' elements.

20

38. $R=\{(a,1)(b,2)(c,3)(d,4)\}$ then the inverse of this relation is _____

$\{(1,a)(2,b)(3,c)(4,d)\}$

39. Logic gate NOT does not define a binary operation on (0,1) because _____

It takes a single input and gives a single output

40. How many real numbers exist between 1 and 5

3

41. The number pi is

Irrational

42. The number square root 2 is

Irrational

43. Range the relation $\{(0,1)(3,22),(90,34)\}$

$\{0,3,90\}$

44. Supherical coordinate 0 is related to the cylindrical coordinate as _____

@=@

45. Operation of subtraction is a binary operation on the set _____

Integers

46. Let A $\{1,2,3,4\}$ and $R=\{(1,2),(2,3),(3,3),(3,4)\}$ be a relation on A. Then which one of the following ordered pair has made R not an irreflexive relation?

(3,3)

47. Input values of the function are called the _____

Domain

48. Range of function $f(x)=|x|$ will be

Set of positive real numbers

49. Which of the following is not a binary operation on the set of integers?

Division

50. In the matrix representation of an irreflexive relation all the entries in the main diagonal are _____

0

51. If the partition set of A is $\{A_1,A_2\}$ then

$A_1 \cap A_2 = \text{not empty set}$

52. Let $A = \{a,b\}$ then $P(A) =$

$\{\text{Non empty set}, \{a\}, \{b\}, \{a,b\}\}$

53. Which relations below are not functions?

$\{(13,14),(13,5),(16,7),(18,13)\}$

54. In the directed graph of an antisymmetric relation there is _____ pair of arrows between two distinct elements of the set.

No

55. If a relation $R = (1,1), (2,1), (2,2)$ is given then which of the following is not true about this relation

R is irreflexive

56. Let R and S be transitive relations on a set A then _____

Neither $R \cup S$ is transitive nor $R \cap S$ is transitive

57. Let $R = \{(1,2), (3,4), (5,6), (7,8)\}$. Domain of the inverse of the relation is _____

$\{1,3,5,7\}$

58. Let $A = \{1,2,3,4,5\}$ and $B = \{4,9,16,17,25\}$. Then the relation $R = \{(2,4), (3,9), (4,16), (9,17)\}$ The inverse of R is'

$\{(4,2), (9,3), (16,4), (17,9)\}$

59. Let R be a relation on a set A. If R is symmetric then its complement is _____

symmetric

60. Which is not a binary operation on the set of natural numbers N ?

Subtraction

61. If a relation $R = \{(1,1), (2,1), (1,2), (2,2)\}$ is given then which of the following is not true about this relation.

R is symmetric

62. $R = \{(a,1), (b,2), (c,3), (d,4)\}$ then the inverse of this relation is _____

$\{(1,a), (2,b), (3,c), (4,d)\}$

63. For any set A, the Cartesian product of A and A is known as _____

Universal relation

64. Let $A = \{p, q, r, s\}$ and define a relation R on A by $R = \{(p,p), (p,r), (q,r), (q,s), (r,s)\}$ Then which one of the following is the correct statement about R:

R is not reflexive

65. $A = \{1,2\}$ $B = \{3,4\}$, $R = \{(1,3), (2,4)\}$. Then the complement of R is _____.

$\{(1,4), (2,3)\}$

66. Domain of a relation symbolically written as _____.

$\text{Dom}(R) = \{a \in A \mid (a,b) \in R\}$

67. Let $X = \{2,4,5\}$ and $Y = \{1,2,4\}$ and R be a relation from X to Y defined by $R = \{(2,4), (4,1), (a,2)\}$. For what value of 'a' the relation R is a function?

5

68. Let $A = \{1,2,3,4,5,6,7,8,9\}$, then which of the following sets represent the partition of the set A?

$A = \{1,3,5,7,9\}$, $B = \{2,4,6\}$, $C = \{8\}$

69. Let $A = \{1,2,3\}$ and $B = \{2,4\}$ then number of binary relations from A to B are _____.

64

70. A relation R is said to be _____ iff it is reflexive, antisymmetric and transitive.

Partial order Relation

71. Let f be a function from $X = \{2,4,5\}$ to $Y = \{1,2,4,6\}$ defined as: $f = \{(2,6), (4,2), (5,1)\}$. The range of f is _____

$\{1,2,6\}$

72. Let $A = \{0,1,2\}$ and $R = \{(0,2), (1,1), (2,0)\}$ be a relation on A. Then which of the following statement about R is true?

R is symmetric

73. Let $A = \{2,3,4\}$ and $B = \{2,6,8\}$ and let R be the "divides" relation from A to B i.e for all (a,b) belong to (Cartesian product of A and B), $a, R b$ iff $a \mid b$ (a divides b). Then

$R=\{(2,2),(2,6),(2,8),(3,6),(4,8)\}$

74. Let $A=\{1,2,3,\dots,50\}$ and $B=\{2,4,6,8,10\}$. Then the Cartesian product of A and B has _____ elements.

250

75. In the matrix representation of an reflexive relation all the entries in the main diagonal are _____

1

76. Which of the following is not a type of a relation?

Permutation

77. Let $X=\{2,4,5\}$ and $Y=\{1,2,4\}$ and R be a relation from X to Y defined by $R=\{(2,4),(4,1),(a,2)\}$. For what value of 'a' the relation R is a function ?

5

78. Which of the following is not a representation of a relation?

Venn diagram

79. Let $A=\{1,2,3,4\}$ and define the following relations on A. Then $R=\{(1,3),(1,4),(2,3),(2,4),(3,1),(3,4)\}$ is _____

R is irreflexive

80. The range of $f:X \rightarrow Y$ is also called the image of

True

81. Complementary Relation symbolically written as _____

$R=A*B- R=\{(a,b) \in A*B | (a,b) \text{ not belong to } R\}$

82. Let $A=\{1,2,3,4\}$ and $R=(1,1)(2,2),(3,3),(4,4)$ then R is

All options

83. If a relation $R=\{(1,1),(2,1),(1,2),(2,2)\}$ is given then which of the following is not true about this relation?

R is irreflexive

84. Which of the following logical connective is not a binary operation ?

Implication

85. A set may be dividend up into its disjoint subsets, such division is called _____

Partition

86. If $A=(1,2,3) \& B=(4,5,6)$ and $R =\{(1,4)(2,5)(3,6)(3,4)\}$ The complementary relation is _____

$A*B(\text{difference or } -) R$

87. In matrix representation of a _____ relation, the diagonal entries are always 1.

Reflexive

88. R is not symmetric iff there are elements a and b in A such that _____

(a,b) belongs to R but (b,a) does not belong to R

89. Which relations below are functions?

$R1=\{(3,4),(4,5),(6,7),(8,9)\}$

$R2=\{(3,4),(4,5),(6,7),(3,9)\}$

$R3=\{(-3,4),(4,-5),(0,0),(8,9)\}$

$R4=\{(8,11),(34,5),(6,17),(8,19)\}$

R1 and R3 are functions

90. The logic gate OR and AND are uniary operation on $\{0,1\}$

False

91. There is atleast one loop in the graph of an irreflexive relation

False

92. There is atleast one loop in the graph of an reflexive relation

True

93. A contains 3 elements and B contains 2 elements, then number of subsets of $A \times B$ are _____

64

94. Let $A = \{1, 2, 3\}$ and $B = \{0, 1, 2\}$ and $C = \{a, b\}$ $R = \{(1, 0), (1, 2), (3, 1), (3, 2)\}$ $S = \{(0, b), (1, a), (2, b)\}$ composite of R and S = _____

$\{(1, b), (1, a), (3, a), (3, b)\}$

95. If R is transitive then the inverse relation will be transitive

True

96. The number of elements in the power set of P(not empty set) denoted by $P(P(\text{not empty set}))$ is

2

97. The function defined from $\mathbb{Z}$ to $\mathbb{Z}$ as $f(x) = 1/(x+2)(x-2)$ is not well defined because _____

Function is not defined at $x=2$ and $x=-2$

98. Rang of relation $\{(0, 1), (3, 22), (90, 34)\}$ is _____

$\{1, 22, 34\}$

99. The number of elements in the power set of P(not empty set) denoted by $P(P(\text{not empty set}))$ is

1

100. Let $R = \{(1, 2), (3, 4), (5, 6), (7, 8)\}$. Domain of inverse of the relation is _____

$\{2, 4, 6, 8\}$

101. The relation 'divides' on the set of integers is _____

A symmetric relation

102. Operation of subtraction is a binary operation on the set of _____

Integers

103. If R is transitive then the inverse relation will be transitive.

True

104. Let $A = \{1, 2, 3, 4\}$ and define the relation R on A by $R = \{(1, 2), (2, 3), (3, 3), (3, 4)\}$. Then _____

R is both reflexive and irreflexive

105. A set may be divided up into its disjoint subsets, such division is called

Partition

106. If a set A contains n elements then the number of elements in its power set $P(A)$ is _____

2^n

107. Range of a relation symbolically written as _____.

$\text{Ran } R = \{b \in B \mid (a, b) \in R\}$

108. Let R be a binary relation on a set A. IF R is anti symmetric then _____.

Inverse of R is anti symmetric

109. Let A be a set with m elements and B be a set with n elements then the number of elements in $A \times B$ are

$m.n$

111. Let $A = \{1, 2, 3, 4\}$ and define the following relation on A. Then $R = \{(1, 3), (2, 2), (2, 4), (3, 1), (4, 2)\}$ Is

R is transitive or reflexive....both

110. If $A = \{1, 2, 3\}$ & $B = \{4, 5, 6\}$ and $R = \{1, 4\}, \{2, 5\}, \{3, 6\}, \{3, 4\}$. The complementary relation is _____

$A \times B$ (difference or -) R

111. Let R be a relation on a set A. If R is reflexive then its complement is _____

irreflexive

112. $25 \equiv 1 \pmod{3}$ means that 3 divides _____

25-1

113. Let R be the universal relation on a set A then which one of the following statement about R is true ?

R is reflexive, symmetric and transitive

114. Domain of a relation symbolically written as _____

$\text{Dom}(R) = \{a \in R \mid (a,b) \in R\}$

115. Let R be a relation on a set A. R is transitive if and only if for all $a,b,c \in A$ then $(a,b) \in R$ and $(b,c) \in R$ then $(a,c) \in R$

116. Let A be a non-empty set and $P(A)$ the power set of A. Define the 'subset' relation, $\subseteq$ as follows for all $X, Y \in P(A)$, $X \subseteq Y \iff$ for all x , if $x \in X$ then $x \in Y$. Then $\subseteq$ is _____

$\subseteq$ is partial order relation

117. Define a relation $R = \{(1,1), (2,2), (3,3), (1,3)\}$ the relation is

R is reflexive and transitive

118. Let R be a relation on a set A. R is transitive if and only if for all $a,b,c \in A$ then.

$(a,b) \in R$ and $(b,c) \in R$ then $(a,c) \in R$

119. Let R and S be reflexive relations on a set A then $R \cap S$ is reflexive

True

Quiz 2 spring 2021 Updated

1. A function whose range consists of only one element is called _____

Constant function

2. The set Z of all integers is _____

Countable

3. One-to-one correspondence means the condition of _____

Both (a) and (c)

4. Let $X = \{1, 5, 9\}$ and $Y = \{3, 4, 7\}$, Define a function f from X to Y such that $f(1)=7, f(5)=3, f(9)=$ _____. Which is true f(9) to make it a one-to-one (injective) function?

4

5. What will be the fourth term of the following sequence $1/2, 2/3, 3/4$ _____?

$4/5$

6. The value of $6!$ =

720

7. A constant function is one to one iff its _____ is a singleton.

Domain

8. A constant function is onto iff its _____ is a singleton.

Co-domain

9. Number of one to one functions from $X = \{a, b\}$ to $Y = \{u, v\}$ are equal to _____.

2

10. If f is defined recursively by $f(0) = -1$ and $f(n+1) = f(n) + 3$, then $f(2) =$ _____.

5

11. A function whose inverse function exists is called a/an _____

Invertible function

12. Let $f(2)=3, g(2)=3, f(4)=1$ and $g(4)=2$ then the value of $f \circ g(4)$ is.....

3

13. Let $A=\{1,2,3,4\}$ and $B=\{7\}$ then the constant function from A to B is _____.

Onto

14. Composition of a function is a commutative operation.

False

15. Composition of a function is not a commutative operation

True

16. The sum of first five whole number is _____.

10

17. If f and g are two one-to-one functions, then their composition that is gof is one-to-one.

True

18. Inverse of a surjective function is always a function.

False

19. Inverse of a surjective function may not be a function

True

20. Let $X=\{1,2,3,4\}$ and $Y=\{7,8,9\}$ and let f be function defined from X to Y such that f is onto then which of the following statement about f is true?

Co-domain of f must contain 3 elements

21. If $f: X \rightarrow Y$ and $g: Y \rightarrow Z$ are both onto functions. Then $\text{gof}; X \rightarrow Z$ is _____

onto

22. If f and g are two one-to-one functions, then their composition gof is _____

One-to-one

23. If $f: W \rightarrow X$, $g: X \rightarrow Y$, and $h: Y \rightarrow Z$ are functions, then _____

$(\text{hog})\text{of} = \text{ho}(\text{gof})$

24. Cardinality of positive prime numbers less than 20 is _____.

8

25. IF $f(x)=\sin^{-1}(x)$ and $g(x)=\sin x$ then $\text{gof}(x)$ is _____.

X

26. $0!=$ _____.

1

27. An important data type in computer programming consists of _____.

Finite sequences

28. Let $f(x)=2x$ and $g(x)=x+2$ define functions f and g from R to R, then $(f-g)(x)$ is _____.

$x-2$

29. The total number of terms in an arithmetic series $0+5+10+15+....50$ are _____.

11

30. $9!/6!=$ _____

504

31. Let $f(x)=3x$ and $g(x)=3x-2$ define functions f and g from R to R, THEN $(F+G)(X)$ is _____

$6x-2$

32. If f is a bijective function then $(f^{-1}f(x))$ is equal to

X

33. A sequence whose terms alternate in sign is called an _____

Alternating sequence

34. Common ration in the sequence "4, 16, 64, 256,..." is.....12.

4

35. 0.8181818181 is a infinite geometric series.

True

36. The word 'algorithm' refers to a step-by-step method for performing some action.

True

37. A predicate become _____ when its variables are given specific values

Sentence

38. The sum of two irrational numbers must be an irrational number.

False

39. The sum of two irrational numbers need not be irrational number

True

40. The division by zero is allowed in mathematics.

False

41. The product of any two consecutive positive integers is divisible by 2

True

42. If 'n' is an odd integer then n^3+n is _____.

Even

43. For integers a,b,c, If divides b and a divides c, then a divides (a+b).

False

44. Quotient remainder theorem states that for any positive integer d, there exist unique integer q and r such that _____ and $0 \leq r < d$

$N=d.q+r$

45. A rule that assigns a numerical value to each outcome in a simple space is called

Random variable

46. If A and B are two disjoint (mutually exclusive) events then $P(AB)=$

$P(A) + P(B)$

47. How many ways are there to select five players from a 10 member tennis team to make a trip to a match to another school?

$C(10,5)$

48. The expectation of x is equal to

$\sum xf(x)$

49. If $P(A \text{ intersection } B) = P(A) P(B)$ THEN THE events A and B are called

Independent

50. A walk that starts and ends at the same vertex is called.

None options

51. How many integers from 1 through 1000 are neither multiple of 3 nor multiple of 5

497

52. What is the probability of getting a number greater than 4 when a die is thrown?

$\frac{3}{5}$

53. Euler formula for graphs is_____.

$F=e-v+2$

54. $x+a, x+3a, x+5a, \dots$ is an _____

Arithmetic sequence

55. Composition of a function is a commutative operation.

False

56. Real valued function is a function that assigns _____ to each member of its domain.

Only a real number

57. Let $X=\{1,2,3,4\}$ and a function 'f' defined on X $f(1)=1, f(2)=2, f(3)=3, f(4)=4$ then _____

F is an identity function

58. A constant function is surjective if and only if _____

The co-domain consists of a single element

59. Cardinality means the total number of elements in a set.

True

60. If $f(x)=2x$ and $g(x)=x$ then $g(f(x))$ is _____.

$2x^2$

61. Let $f:R \rightarrow R$ is one to one function then cf , c is not equal 0 is also one to one function.

True

62. Let $X=\{1,2,3,4\}$ and a function 'f' defined from X to X by $f(1)=1, f(2)=1, f(3)=1, f(4)=1$ then which of the following is true?

F is a constant function

63. If f and g are two one-to-one functions, then their composition that is $g \circ f$ is one-to-one.

True

64. Which of the following is not correct for a 'sequence'?

A sequence is a relation whose domain is the set of natural numbers

65. $F(x)=x^2$ is not one to one function from R to R^+

True

66. Let $f: R \rightarrow R$ is one to one function then cf , c is not equal to 0 is also one to one function.

True

67. Let $f(x)=x+2$ then $f^{-1}(x)$ is _____

$x-2$

68. Let $f(x)=x^2+1$ define functions f from R to R and $c=2$ be any scalar, then $cf(x)$ is _____.

$2x^2-1$

69. One to one correspondence means the condition of _____.

Both (a) and (c)

70. A function $F: R \rightarrow R$ defined by $f(x) = \text{square root } x$ is a real valued function.

False

71. If $g:R \rightarrow R$ defined by $g(x)=e^x$ is a real valued function of a real variable.

True

72. A function $F:R \rightarrow R$ defined by $f(x) = \log x$ is a real valued function

True

73. $\frac{1}{2}$, then 3rd term of sequence is _____.

$\frac{1}{2}$

74. The process of defining an object in terms of smaller versions of itself is called recursion.

True

75. Which of the following is not correct for a 'sequence'?

A sequence is a relation whose domain is the set of natural numbers

76. A set is called countable if, and only if, it is _____.

Finite and countable infinite.....both

77. A set that is not countable is called _____.

Uncountable

78. A sequence whose terms alternate in sign is called an _____.

Alternating sequence

79. Let $f: \mathbb{R} \rightarrow \mathbb{R}$ is one to one function then c, f is also one to one function for _____.

C is not equal 0

80. Let $f(x) = x+3$ then $f^{-1}(x)$ is _____.

x-3

81. Let f and g be two functions defined by $f(x) = x+2$ and $g(x) = 2x+1$. Then the composition of f and g is _____.

2x+3

82. Number of one to one functions form $X=\{a,b\}$ to $Y=\{u,v\}$ are equal to _____

2

83. The fibonacci sequence is deined as $F_0=1, F_1=1, F_k=F_{k-1}+F_{k-2}$ for all integers $k \geq 2$ then which of the following is true for F_2

$F_2-F_1=2+1=3$

84. $x+a, x+3a, x+5a, \dots$ is a/an _____.

Arithmetic sequence

85. Inverse of a function may not be a function.

True

86. In the following sequence $a_k = K/(k+1)$, for $k=1$, a_1 will be _____.

$\frac{1}{2}$

87. If $f(x)=x$ and $g(x)=-x$ are both one to one function then $(f+g)(x)$ is also one to one function.

False

88. If $f(x)=x$ and $g(x)=-x$ are both one to one function then $(f+g)(x)$ is not one to one function.

True

89. The function ' f ' and ' g ' are inverse of each other if and only if their composition gives _____.

Identity function

90. Which of the following set is the domain of a sequence?

Set of real numbers

91. Let C is defined as the set of all countries in the world then C is a _____.

Finite set

92. A constant function is surjective if and only if _____.

The co domain consists of a single element

93. The sum of the series $a_1 + a_2 + a_3 + \dots$ can be written as _____.

$$\sum_{i=1}^{\infty} a_k$$

94. Inverse of a function may not be a function.

True

95. If $F_k = F_{k-1} + F_{k-2}$ then $F_0 = 1, f_1 = 2$, then $F_2 =$ _____

3

96. Let $X=\{1,2,3,4\}$ and a function ' f ' defined from X to X by $f(1)=1, f(2)=1, f(3)=1, f(4)=1$ then which of the following is true?

F is a constant function

97. The composition of function is always

Associative

98. A set is countably infinite if, and only if, it has the same cardinality as the set of

Positive integers

99. Two functions ' f ' and ' g ' from ' X ' to ' Y ' are said to be equal if and only if _____.

$F(x)=g(x)$ for all 'x' belongs to X

100. $Y=x^3$ is a graph of bijective function from R to R.

True

101. Domain and range are same for_____.

Identity funtion

102. Let $X=\{1,2,3,4\}$ and a function 'f' defined on X by $f(1)=1, f(2)=2, f(3)=3$

F is an identity function

103. Composition of a function is a commutative operation.

True

104. Inverse of a surjective function is always a function.

False

105. A function whose inverse function exists is called a/an_____.

Invertible

106. Given a set X define a function I from X to X by $i(x)=x$ from all x belonging to X . Then_____.

I is both injective and surjective

107. Let $f: R \rightarrow R$ is a one to one function then c,f is also one to one function for.

C is not equal 0

108. Let $X=\{1,5,9\}$ and $Y=\{3,4,7\}$. Define a function f from X to Y such that $f(1)=7, f(5)=3, f(9)=$ _____.

Which is true for f(9) to make it a one-to-one (injective) function?

4

109. Which of the following is not a predecessors of ak?

A_{k+1}

110. Two functions 'f' and 'g' from X to Y are said to be equal if and only if_____.

$F(x)=g(x)$ for all 'x' belongs to x

111. The two functions 'f' and 'g' are equal if_____.

$F(x) = 3x$ and $g(x) = 6x^2 + 3x / 2x^2 + 1$ for all $x \in R$

112. If first term of a geometric sequence is 2 and common ratio is $\frac{1}{2}$, then 3rdter, of sequence.

$\frac{1}{4}$

113. $Y = \text{square root } x$ is an _____ function form R^+ to R

One to one function

114. $Y = x^2$ is an _____ function form R to R^+

NOT ONE TO ONE FUNTION

115. If a function $(gof)(x) : X \rightarrow Z$ is defined as $(gof)(x)=g(f(x))$ for all $x \in X$, Then the function_____---

(gof)

116. If 0 is the first term and -2 be the common difference of an arithmetic series, then the sum of first five terms of series is _____.

-20

117. If $f(x)=\sin^{-1}(x)$ and $g(x) = \sin x$ then $gof(x)$ is _____.

X

118. $F: X \rightarrow Y$ that is both one to one and onto is called a _____.

Bijective function

119. What does 'y' denotes in a geometric sequence?

Common ratio

120. Let g be a function defined by $g(x)=x+1$. Then the composition of (gog).

X+2

121. A graph of a function f is one to one iff every horizontal line intersects the graph in at most one point.

True

122. Which of the following is true for the following sequence?

If n is even, then $C_n=2$ and if n is odd, then $C_n = 0$

123. The function ' f ' and ' g ' are inverse of each other if and only if their composition gives _____.

Identity function

124. $N!$ is defined to be _____.

The product of the integers from 1 to n

125. Let $A = \{1,2,3,4\}$ and $B=\{7\}$ then the constant function from A to B

Both one to one and onto

126. A set is called countable if, and only if, it is _____.

Countably infinite and finite

127. If $f(x) = x$ and $g(x) = -x$ are both one to one functions then $(f+g)(x)$ is also one to one function.

False

128. If a is the 1st term and d be the common difference of an arithmetic sequence then the sequence is $a, a+d, a+2d, a+3d, \dots$

True

129. $x+a, x+3a, x+5, \dots$ is a/an _____.

Arithmetic sequence

130. inverse of an injective function may not be a function.

True

131. $y=x^3$ is a graph of bijective function form R to R

False

132. Two functions ' f ' and ' g ' from x to y are said to be equal if and only if _____.

$F(x)=g(x)$ for all ' x ' belongs to x

133. Common ration in sequence ' $36, 12, 4, 4/3, \dots$ ' is

$1/3$

134. A set is called finite if, and only if, is the _____ or there is -----.

Empty set or one-to-one

135. Let $f(X)=x^2-1$ and $g(x)=x+1$ define functions f and g from R to R , then $(f/g)x$

$x-1$

136. A graph of a function f is one to one iff every horizontal line intersects the graph in at most one point.

True

137. Let g be a function defined by $g(x) = x+1$. Then the composition of (gog) .

$X+2$

138. $F:X \rightarrow Y$ that is both one to one and onto is called a _____.

Bijective function

139. What does ' I ' denotes in a geometric sequence?

Common ratio

140. Let $A=\{1,2,3,4\}$ and $B=\{7\}$ then the constant function from A to B is _____.

Both one to one and onto

141. $N!$ is defined to be _____.

The product of the integers from 1 to n

142. A set is called countable if, and only if, it is _____.

Both b and c

143. Which of the following is the example of an alternating sequence?

$$C_n = n/n+1 \text{ for } n \geq 0$$

144. $X+a, x+3a, x+5a, \dots$ is an _____

Arithmetic sequence

145. 0, -5, -10, -15, ... is an _____.

Arithmetic sequence

146. 5, 9, 13, 17, ... is an _____.

Arithmetic sequence

147. An important data type in computer programming consists of _____.

Finite sequence

148. One-to-one correspondence means the condition of _____.

One-one and onto both

149. Cardinality means the total number of elements in a set.

True

150. Inverse of a function may not be a function.

True

151. The functions 'f' and 'g' are inverse of each other if and only if their composition gives _____.

Identity function

152. A set is called finite if , and only if, it is the _____ or there is _____.

Empty set or one-to-one

153. Let f and g be the two functions from R to R defined by $f(x) = |x|$ and $g(x) = \text{square root } x^2$ for all $x \in R$, then _____.

$F(x)$ is not equal to $g(x)$

154. If $f^{-1}(x) = 6-x/2$ then $f^{-1}(2)$ is _____.

2

155. Let $f(2)=3, g(2)=3, f(4)=1$ and $g(4)=2$ then the value of $f \circ g(4)$ is _____.

3

156. An important data type in computer programming consists of _-----.

Finite sequence

157. Let $f(x)=x+3$ then $f^{-1}(x)$ is _____.

$x-3$

158. If $f: X \rightarrow Y$ and $g: Y \rightarrow Z$ are both onto function. Then $g \circ f: X \rightarrow Z$ is _____.

One-to-one function

159. The functions 'f' and 'g' are inverse of each other if and only if their composition gives

Identity function

160. The two function 'f' and 'g' are equal if _____.

$$F(x) = 3x \text{ and } g(x) = 6x^2+3x/2x+1 \text{ for all } x \in R$$

161. Two functions 'f' and 'g' from X To Y are said to be equal if and only if-----.

$F(x)$ and $g(x)$ for all 'x' belongs to X

162. Which of the following set is the domain of a sequence?

Set of natural numbers

163. If 1st term of a geometric sequence is 2 and common ratio is $1/2$, then 3rd term of sequence is _____.

$1/2$

164. Composition of a function is a commutative operation.

True

165. If a function $(g \circ f)(x): X \rightarrow Z$ is defined as $(g \circ f)(x) = g(f(x))$ for all $x \in X$. Then the function _____ is known as composition of f and g .

$(g \circ f)$

166. A set is countably infinite if and only if, it has the same cardinality as the set of _____

Positive integers

167. The 3rd term of the sequence $b_n = 5^n$ is _____.

125

168. If f is a bijective function then $(f^{-1}(f(x)))$ is equal to _____.

x

169. Let $f(x) = x$ and $g(x) = -x$ for all $x \in \mathbb{R}$, then $(f+g)(x)$ is _____.

0

170. An infinite sequence may have only a finite number of values.

True

171. The functions $f \circ g$ and $g \circ f$ are always equal.

False

172. If f and g are two one-to-one functions, then their composition that is $g \circ f$ is one-to-one.

True

173. A function whose range consists of only one element is called _____.

Constant function

174. Let $X = \{1, 5, 9\}$ and $Y = \{3, 4, 7\}$. Define a function f from X to Y such that $f(1)=7$, $f(5)=3$, $f(9)=4$ then which of the following statement about ' f ' is true?

f is both one-to-one and onto

175. $Y = x^3$ is a graph of bijective function from $\mathbb{R}$ to $\mathbb{R}$.

True

176. A function whose inverse function exists is called a/an _____.

Invertible

177. Let f and g be two functions defined by $f(x) = x+2$ and $g(x) = 2x+1$. Then the composition of f and g is _____.

$2x + 5$

178. If r is a positive real number, then the value of r in $3, r, r = -27r$ is

-9

179. The _____ of the terms of a sequence forms a series.

Sum

180. The sum of first five whole number is _____.

10

181. If $f_k = f_{k-1} + f_{k-2}$ then $f_0 = 1$, $f_1 = 2$, then $f_2 =$ _____.

3

182. Let $f(x) = 3x$ and $g(x) = x + 2$ define functions f and g from $\mathbb{R}$ to $\mathbb{R}$, then $(f \cdot g)(x)$ is _____.

$3x^2 + 6x$

183. Let R be a relation on a set A . If R is reflexive then its complement is _____.

Irreflexive

184. If $A =$ Set of students of virtual university then A has been written in the _____.

Descriptive form

185. If a function $(g \circ f)(x): X \rightarrow Z$ is defined as $(g \circ f)(x) = g(f(x))$ for all $x \in X$. Then the function _____ is known as composition of f and g .

$(g \circ f)$

186. If X and Y are independent random variables and a and b are constants, then $\text{Var}(aX + bY)$ is equal to _____.

$a\text{Var}(X) + b\text{Var}(Y)$

187. Let $A = \{1, 2, 3\}$ and $B = \{2, 4\}$ then number of functions from A to B are _____.

8

188. p is equivalent to q' means _____.

p is necessary and sufficient for q .

189. Let A and B be subsets of U with $n(A) = 12$, $n(B) = 15$, $n(A') = 17$, and $n(A \cap B) = 8$, then $n(U) =$ _____.

29

190. For the following relation to be a function, x can not be what values?

$R = \{(2,4), (x,1), (4,2), (5,6)\}$

x cannot be 2, 4 or 5

191. Find the number of the word that can be formed of the letters of the word "ELEVEN".

120

192. There are three bus lines between A and B , and two bus lines between B and C . Find the number of ways a person can travel round trip by bus from A to C by way of B ?

6

193. Among 20 people, 15 either swim or jog or both. If 5 swim and 6 swim and jog, how many jog?

16

194. A predicate becomes _____ when its variables are given specific values.

statement

195. Find the number of distinct permutations that can be formed using the letters of the word "BENZENE".

420

196. Suppose there are 8 different tea flavors and 5 different biscuit brands. A guest wants to take one tea and one brand of biscuit. How many choices are there for this guest?

40

197. In how many ways a student can choose one of each of the courses when he is offered 3 mathematics courses, 4 literature courses and 2 history courses.

24

198. If $p \leftrightarrow q$ is True, then _____.

p and q both are True.

199. If A and B be events with $P(A) = 1/3$, $P(B) = 1/4$ and $P(A \cap B) = 1/6$, then $P(A \cup B) =$ _____ .

5/12

200. An integer n is a perfect square if and only if _____ for some integer k.

$n = k^2$

201. If A and B are disjoint finite sets then $n(A \cup B) =$ _____.

$n(A) + n(B)$

202. Let $X = \{2, 4, 5\}$ and $Y = \{1, 2, 4\}$ and R be a relation from X to Y defined by $R = \{(2,4), (4,1), (a,2)\}$. For what value of 'a' the relation R is a function ?

5

203. $\sim(P \rightarrow q)$ is logically equivalent to _____.

$p \wedge \sim q$

204. A tree is normally constructed from _____.

left to right

205. A Random variable is also called a _____.

Chance Variable

206. The conjunction $p \wedge q$ is True when _____.

p is True, q is True

207. The logical statement $p \wedge q$ means _____.

p AND q

208. Which of the followings is the factorial form of $5 \cdot 4$?

$5!/3!$

209. What is the minimum number of students in a class to be sure that two of them are born in the same month?

13

210. If p is false and q is true, then $\sim p \leftrightarrow q$ is _____.

True

211. If f and g are two one-to-one functions, then their composition that is gof is one-to-one.

TRUE

212. $(p \vee \sim p)$ is the _____.

Tautology

213. $(-2)! = \underline{\hspace{2cm}}$?

Undefined

214. If p = It is raining, q = She will go to college
"It is raining and she will not go to college"
will be denoted by

$p \wedge \sim q$

215. Let $X = \{1, 2, 3\}$, then 2-combinations of the 3 elements of the set X are $\underline{\hspace{2cm}}$?

$\{1, 2\}, \{1, 3\}$ and $\{2, 3\}$

216. Let $f(x) = x^2 + 1$ define functions f from R to R and $c = 2$ be any scalar, then $c \cdot f(x)$ is $\underline{\hspace{2cm}}$.

$2x^2 + 2$

217. The disjunction of p and q is written as $\underline{\hspace{2cm}}$.

$p \vee q$

218. If X and Y are independent random variables, then $E(XY)$ is equal to

$E(x)E(y)$

219. How many possible outcomes are there when a fair coin is tossed four times?

16

220. Which of the followings is the product set $A * B * C$? where $A = \{a\}$, $B = \{b\}$, and $C = \{c, d\}$.

$\{(a, b, c), (a, b, d)\}$

221. The number of the words that can be formed from the letters of the word, "COMMITTEE" are

$9! / (2!2!2!)$

222. One-to-One correspondence means the condition of $\underline{\hspace{2cm}}$.

One-One and onto

223. The functions $f \circ g$ and $g \circ f$ are always equal.

FALSE

224. If order matters and repetition is allowed, then which counting method should be used in order to select ' k ' elements from a total of ' n ' elements?

K-Sample

225. Determine values of x and y , where $(2x, x + y) = (8, 6)$.

$x = 4$ and $y = 2$

226. Let g be a function defined by $g(x) = x + 1$. Then the composition of $(g \circ g)(x)$ is $\underline{\hspace{2cm}}$.

$x + 2$

227. What is the truth value of the sentence?

'It rains if and only if there are clouds.'

False

228. Reductio and absurdum' is another name of _____.

proof by contradiction

229. x belongs to A or x belongs to B , therefore x belongs to _____.

$A \cup B$

230. Which of the followings is the product set $A * B * C$?where $A = \{a\}$, $B = \{b\}$, and $C = \{c, d\}$.

$\{(a, b, c), (a, b, d)\}$

231. Real valued function is a function that assigns _____ to each member of its domain.

only a real number

232. The negation of "Today is Friday" is

Today is not Friday

233. A non-zero integer d divides an integer n if and only if there exists an integer k such that _____

$n = dk$

234. The statement $p \rightarrow q$ is logically equivalent to $\sim q \rightarrow \sim p$

True

235. Let R be the universal relation on a set A then which one of the following statement about R is true?

R is reflexive, symmetric and transitive.

236. Let $f(x)=3x$ and $g(x) = 3x - 2$ define functions f and g from R to R . Then $(f+g)(x) =$ _____.

$6x - 2$

237. The switches in parallel act just like _____.

OR gate

238. The converse of the conditional statement $p \rightarrow q$ is

$q \rightarrow p$

239. If X and Y are random variables, then $E(aX)$ is equal to

$aE(X)$

240. Which of the following statements is true according to the Division Algorithm?

$17 = 5 \times 3 + 2$

241. Let $p \rightarrow q$ be a conditional statement, then the statement $q \rightarrow p$ is called _____.

Converse

242. The disjunction $p \vee q$ is False when _____.

p is False, q is False.

243. A student can choose a computer project from one of the two lists. The two lists contain 12 and 18 possible projects, respectively. How many possible projects are there to choose from?

30

244. The converse of the conditional statement 'If I live in Quetta, then I live in Pakistan' is _____.

If I live in Pakistan, then I live in Quetta.

245. The functions 'f' and 'g' are inverse of each other if and only if their composition gives _____.

identity function

246. $P(0, 0) =$ _____?

1

247. Let p_1, p_2, p_3 be True premises in a given Truth Table. If the conjunctions of the Conclusion with each of p_1, p_2, p_3 are True, then the argument is _____.

Valid

248. If p is false and q is false, then $\sim p$ implies q is _____.

False

249. A box contains 5 different colored light bulbs. Which of the followings is the number of ordered samples of size 3 with replacement?

125

250. Let $A = \{2, 3, 5, 7\}$, $B = \{2, 3, 5, 7, 2\}$, $C =$ Set of first five prime numbers. Then from the following which statement is true ?

$A = B$

251. The set of prime numbers is _____.

infinite set

252. The contrapositive of the conditional statement 'If it is Sunday, then I go for shopping' is _____.

I do Not go for shopping, then it is Not Sunday.

253. Let p be True and q be True, then $(\sim p \wedge q)$ is _____.

False

254. In how many ways a student can choose a course from 2 science courses,3 literature courses and 5 art courses.

30

255. The method of loop invariants is used to prove _____ of a loop with respect to certain pre and post-conditions.

correctness

256. A student is to answer five out of nine questions on exams. Find the number of ways that can choose the five questions

126

257. If A and B are any two sets, then $A - B = B - A$

False

258. There are 5 girls students and 20 boys students in a class. How many students are there in total ?

25

2nd file confirm

Question No. 1:

If $p = \text{It is raining}$ $q = \text{She will go to college}$

"It is raining and she will not go to college" will be denoted by

☒ $p \wedge \sim q$

☐ $p \wedge q$

☐ $\sim (p \wedge q)$

☐ $\sim p \wedge q$

Question No. 2:

The negation of "Today is Friday" is

☐ Today is Saturday

☒ Today is not Friday

☐ Today is Thursday

☐ None of given

Question No. 3:

The converse of the conditional statement $p \rightarrow q$ is

☒ $q \rightarrow p$

☐ $\sim q \rightarrow \sim p$

☐ $\sim p \rightarrow \sim q$

☐ None of these

Question No. 4:

Contra-positive of given statement "If it is raining, I will take an umbrella" is

☒ I will not take an umbrella if it is not raining. (Pg 19)

☐ I will take an umbrella if it is raining.

☐ It is not raining or I will take an umbrella.

☐ None of these.

Question No. 5:

A statement is also referred to as a

☒ Proposition (pg 4)

☐ Conclusion

☐ Order

☐ None of these

Question No. 6:

The statement “It is not raining if and only if roads are dry” is logically equivalent to

If roads are dry then it is not raining.

None of these.

Roads are dry if and only if it is not raining

If it is not raining then roads are dry.

Question No. 7:

The statement $\sim (\sim p) = p$ Describes

Commutative Law

Implication Laws

Double negative law

Equivalence

Question No. 8:

An arrangement of rows and columns that specifies the truth value of a compound proposition for all possible truth values of its constituent propositions is called

Truth Table

Venn diagram

False Table

None of these

Question No. 9:

An argument is_____if the conclusion is true when all the premises are true.

Valid

(Pg 25)

Invalid

False

None of these

Question No. 10:

The row in the truth table of an argument where all premises are true is called

Valid row

Invalid row

Critical row (Pg 27)

None of these

Question No. 11:

The statement $p \rightarrow q \equiv (p \wedge \sim q) \rightarrow c$ describes

☐

Commutative Law

☐

Implication Laws

☐

Exportation Law

☒

Reductio ad absurdum

Question No. 12:

$p \leftrightarrow q$ is logically equivalent to $(p \rightarrow q) \wedge (q \rightarrow p)$

☐

TRUE

☐

FALSE

Question No. 13:

According to biconditional $1+1=3$ if and only if sky is yellow.

☒

TRUE (Pg 20)

☐

FALSE

Question No. 14:

A statement that is always true regardless of the truth values of the statement variables called Tautology.

☒

TRUE (Pg 10)

☐

FALSE

Question No. 15:

If p and q are statement variables, then the conjunction of p and q is “p and q” denoted as " $p \vee q$ ".

☐

TRUE

☒

FALSE

Question No: 3 (Marks: 1) - Please choose one

For two sets A,B

$A \cap (B \cup C) = (A \cap B) \cup (A \cap C)$ is called

- ▶ Distributivity of intersection over union
- ▶ Distributivity of union over intersection
- ▶ None of these
- ▶ Distributivity Law

Question No: 6 (Marks: 1) - Please choose one

Check whether

$36 \equiv 1 \pmod{5}$

36 Modulus5 = 1 remainder

$33 \equiv 3 \pmod{10}$

33 Modulus10 = 3 remainder

▶ Both are equivalent

- ▶ Second one is equivalent but first one is not
- ▶ First one is equivalent but second one is not

Question No: 7 (Marks: 1) - Please choose one

A binary relation R is called Partial order relation if

- ▶ It is Reflexive and transitive
- ▶ It is symmetric and transitive
- ▶ It is reflexive, symmetric and transitive
- ▶ It is reflexive, anti-symmetric and transitive (Pg 92)

Question No: 8 (Marks: 1) - Please choose one

The order pairs which are not present in a relation, must be present in

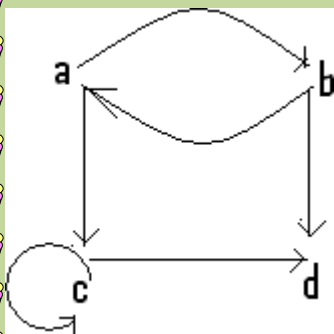
- ▶ Inverse of that relation
- ▶ Composition of relations

► Complementary relation of that relation (pg 97)

Remember Own Prayer

Question No: 9 (Marks: 1) - Please choose one

The relation as a set of ordered pairs as shown in figure is



- ▶ $\{(a,b),(b,a),(b,d),(c,d)\}$
- ▶ $\{(a,b),(b,a),(a,c),(b,a),(c,c),(c,d)\}$
- ▶ $\{(a,b), (a,c), (b,a),(b,d), (c,c),(c,d)\}$
- ▶ $\{(a,b), (a,c), (b,a),(b,d),(c,d)\}$

Question No: 10 (Marks: 1) - Please choose one

A circuit with two input signals and one output signal is called

- ▶ NOT-gate (or inverter)
- ▶ AND- gate
- ▶ None of these

Question No: 11 (Marks: 1) - Please choose one

If $f(x)=2x+1$ then its inverse =

- ▶ $x-1$
- ▶ $\frac{1}{2}(x-1)$
- ▶ $x^2 +2$

$$f(x) = 2x + 1$$

$$y = 2x + 1$$

$$x = \frac{y-1}{2}$$

$$f(x)^{-1} = \frac{y-1}{2}$$

Question No: 12 (Marks: 1) - Please choose one

Null set is denoted by

- ▶ (ϕ) or $\{ \}$. (pg 39)
- ▶ A
- ▶ None of these

Question No: 13 (Marks: 1) - Please choose one

The total number of elements in a set is called

- ▶ Strength
- ▶ Cardinality (pg 141)
- ▶ Finite

Question No: 14 (Marks: 1) - Please choose one

Remember Own Prayer

If $f(x) = x+1$ and $g(x) = -2x^2+1$ then $(2f - 1g)x =$

- ▶ $2x^2 - x$
- ▶ $3x+2$
- ▶ $2x^2 + 2x+1$

$$= (2f - 1g) x$$

$$= 2f(x) - g(x)$$

$$= 2.(x+1) - (-2x^2+1)$$

$$= 2x + 2 + 2x^2 - 1$$

$$= 2x^2 + 2x+1$$

Question No: 15 (Marks: 1) - Please choose one

Let

$$a_0 = 1, a_1 = -2 \text{ and } a_2 = 3$$

$$\text{then } \sum_{j=0}^2 a_j =$$

- ▶ -6
- ▶ 2
- ▶ 8

Question No: 16 (Marks: 1) - Please choose one

Which of the given statement is incorrect?

- ▶ The process of defining an object in terms of smaller versions of itself is called recursion. (Pg 159)
- ▶ A recursive definition has two parts: Base and Recursion.
- ▶ Functions cannot be defined recursively (Pg 159)
- ▶ Sets can be defined recursively. (Pg 165)

Question No: 17 (Marks: 1) - Please choose one

The operations of intersection and union on sets are commutative

- ▶ True (Pg 42)
- ▶ False
- ▶ Depends on the sets given

Question No: 18 (Marks: 1) - Please choose one

The power set of a set A is the set of all subsets of A, denoted $P(A)$.

- ▶ False
- ▶ True (Pg 68)

Question No: 19 (Marks: 1) - Please choose one

What is the output state of an OR gate if the inputs are 0 and 1?

- ▶ 0
- ▶ 1
- ▶ 2
- ▶ 3

Question No: 20 (Marks: 1) - Please choose one

The product of the positive integers from 1 to n is called

- ▶ Multiplication
- ▶ n factorial
- ▶ Geometric sequence

Question No: 6 (Marks: 1) - Please choose one

Let $A = \{1, 2, 3, 4\}$ and $R = \{(1, 1), (2, 2), (3, 3), (4, 4)\}$ then

- ▶ R is symmetric.
- ▶ R is anti symmetric.
- ▶ R is transitive.
- ▶ R is reflexive.
- ▶ All given options are true

Question No: 7 (Marks: 1) - Please choose one

- The inverse of given relation
 $R = \{(1,1),(1,2),(1,4),(3,4),(4,1)\}$ is
- ▶ $\{(1,1),(2,1),(4,1),(2,3)\}$
 - ▶ $\{(1,1),(1,2),(4,1),(4,3),(1,4)\}$
 - ▶ $\{(1,1),(2,1),(4,1),(4,3),(1,4)\}$ (Pg 95)

Question No: 11 (Marks: 1) - Please choose one

- $(A \cap B)^c$
 $= (A^c \cap B^c)$
- ▶ True
 - ▶ False

Question No: 13 (Marks: 1) - Please choose one

- Let g be the functions defined by
 $g(x)= 3x+2$ then $gog(x) =$
- ▶ $9x^2 + 4$
 - ▶ $6x+4$
 - ▶ $9x+8$

$g(g(x)) = g(3x + 2)$
 $= 3(3x + 2) + 2$
 $= 9x + 6 + 2$
 $= 9x + 8$

Question No: 16 (Marks: 1) - Please choose one

- The Common fraction for the recurring decimal 0.81 is
- ▶ $\frac{81}{100}$
 - ▶ $\frac{81}{98}$
 - ▶ $\frac{9}{11}$ (Pg 157)

Question No: 17 (Marks: 1) - Please choose one

- A collection of rules indicating how to form new set objects from those already known to be in the set is called
- ▶ Base
 - ▶ Restriction
 - ▶ Recursion (Pg159)

Question No: 19 (Marks: 1) - Please choose one

- The statement of the form $p \vee \sim p$ is:
- ▶ Tautology (Pg 10)
 - ▶ Contradiction
 - ▶ Fallacy

Question No: 20 (Marks: 1) - Please choose one

- Let A,B,C be the subsets of a universal set U.
 $(A \cup B) \cup C$
Then $A \cap (B \cup C)$ is equal to:



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$$A \cup (B \cap C)$$

$\emptyset$

$$A \cup (B \cup C)$$

Associative Law

Question: If $R = \{(a, a), (b, b), (c, c)\}$ is a relation on the set $A = \{a, b, c\}$ Then R is

- Symmetric only.
- Symmetric and reflexive only.
- Reflexive only.
- **Equivalence relation. (Pg 85)**

Question: The negation of the implication "If P is a square then P is a rectangle" is

- **If P is not a square then P is not a rectangle**
- P is not a square and P is a rectangle
- P is a square and P is not a rectangle.
- None of the above

Question: Identify the false statement

- **$0 \in \emptyset$**
- $\{\emptyset\} \subseteq \{\emptyset\}$
- If A and B are two sets $A \cap B$ and $B \cap A$ then $A = B$. $\subseteq$
- Two sets are disjoint if their intersection is empty set.
- $A \cap A = U$

Question: Let A be a set containing 3 elements then the total number of relations from A to A is

- 2×9
- 2^9
- **$n \times n$**
- $2n$

Question: Let $A = \{1, 2, 3\}$ and $B = \{2, 3, 4, 5\}$ then

- $A = B$.
- A is a subset of B .
- A is improper subset of B .
- **Both 2 and 3.**

Question: Which of the following is not a Proposition?

- **$x > 11$.**
- Sun rounds about the Earth
- $11 + 7 = 18$
- None of above.

Question: $F = \{x \in \mathbb{R} \mid x^{131} + 29x^{12} - 3 = 0\}$

- **finite**
- infinite
- (c) none of above

Question: Let A has the same cardinality as B if and only if ,there is a ----- correspondence between sets A and B

- one-one
- onto
- **(c) Both (a) and (b) (Pg 141)**

Question: Let $A = \{0, 1, 2, 3, 4, 5\}$ and we define functions $f: A \rightarrow A$ and then $g: A \rightarrow A$

$$f(3) = 3, f(4) = 2, f(5) = 2, f(2) = 5, f(1) = 2$$

$$g(1) = 4, g(3) = 3, g(5) = 3, g(2) = 1$$

then $f \circ g(5)$ and $g \circ f(2)$

- **(a) $f \circ g(5) = g \circ f(2)$**
- (b) $f \circ g(5) \neq g \circ f(2)$
- (c) $f \circ g(3) = g \circ f(1)$
- (d) None of the above

$$f \circ g(5) = fg(5)$$

$$= f(3) = 3$$

$$g \circ f(2) = gf(2)$$

$$= g(5) = 3$$

Question: Choose the correct answer:

If f and g are two one-to-one functions, then their composition of gof is

- onto
- **one-to-one (Pg 134)**
- (c) bijective

Question: If $1=1$ then $2=2$, the conditional statement is

- **True**
- False
- None of other.

If $1^3 + 2^3 + 3^3 + \dots + n^3 =$

Then,

$$\left[\frac{n(n+1)}{2} \right]^2 \quad (\text{Pg 157})$$

$$\frac{n(n+1)(2n+1)}{6}$$

$$\frac{n(n+1)}{2}$$

None of these

Question: A set Z has n elements. How many functions are from Z to Z?

- 2_n
- **$n \times n$**
- n_n
- None of the other

Question: Compute the summation

$$\sum_{i=0}^2 (i^2 + 2)$$

- 5
- 3
- 0
- **None of these.**

Question: Let $S = \{n \in \mathbb{Z} / n = (-1)^k, \text{ for some integer } k\}$

- $S = \{1\}$
- $S = \{-1\}$
- $S = \{-1, 1\}$
- None of the other

Question: If $p=T, q=T, r=F$

Then

$$((\sim p) \wedge r) \rightarrow (q \wedge r)$$

Must be

- F
- **T**
- $q \vee r$

➤ None of these.

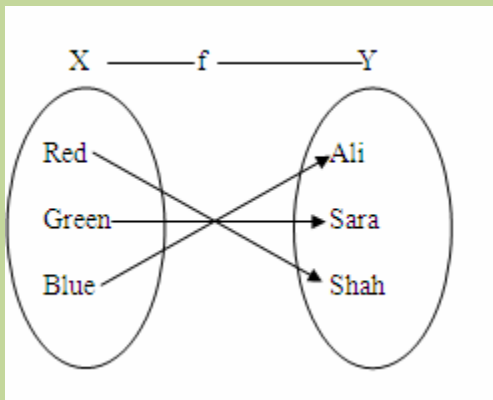
Question: If $A=\{a,b,c,d\}$ then the number of elements of power set $P(A)$ are

- 2^4
- 2^5
- 2^6
- 2^7

Question: Consider the relation $R=\{(1,1),(1,2),(1,4),(2,1),(2,2),(3,3),(4,4)\}$ on $A=\{ 1,2,3,4 \}$ is

- ▶ Symmetric
- ▶ Transitive
- ▶ **Reflexive**
- ▶ All of these

Question: The function defined by the following diagram is $f: X \rightarrow Y$



- ▶ One-to-one
- ▶ Onto
- ▶ **Both one-to-one and onto**
- ▶ None of these

Question: $1, 10, 10^2, 10^3, 10^4, 10^5, 10^6, 10^7, \dots$ is

- ▶ **Arithmetic series (Pg 145)**
- ▶ Geometric series
- ▶ Arithmetic sequence
- ▶ Geometric sequence

Question:

Negations for the given statement “The train is late or my watch is fast” is

- ▶ **The train is not late or my watch is not fast.**
- ▶ The train is not late and my watch is not fast.
- ▶ The train is not late or my watch is fast
- ▶ None of these.

Question:

Let R be the relation from $A=\{a_1, a_2, a_3\}$ (Elements of A are ordered by their subscript) to itself given by the matrix representation. Then R is

$$\begin{pmatrix} 0 & 1 & 0 \\ 1 & 0 & 1 \\ 0 & 1 & 0 \end{pmatrix}$$

- ▶ Reflexive and Symmetric.
- ▶ Symmetric and Transitive.
- ▶ **Irreflexive and Symmetric.**
- ▶ Irreflexive and Anti- Symmetric.

If out of 35 people each person like Discrete Mathematics or Data Structures ,25 like Discrete Mathematics, and 20 like Data structures then the number of people who like

Remember Own Prayer

both Discrete and Data Structures is.....

- ▶ 5
- ▶ 15
- ▶ 10
- ▶ None of these.

Question: Inverse of a function may not be a function

- ▶ True (Pg 124)
- ▶ False

Question No: 1 (Marks: 1) - Please choose one

The inverse of given relation $R = \{(1,1),(1,2),(1,4),(3,4),(4,1)\}$ is

- ▶ $\{(1,1),(2,1),(4,1),(2,3)\}$
- ▶ $\{(1,1),(1,2),(4,1),(4,3),(1,4)\}$
- ▶ $\{(1,1),(2,1),(4,1),(4,3),(1,4)\}$

Question No: 2 (Marks: 1) - Please choose one

Symmetric and antisymmetric are

- ▶ Negative of each other
- ▶ Both are same
- ▶ Not negative of each other (Pg 90)

Question No: 3 (Marks: 1) - Please choose one

Let $A = \{a, b, c\}$ and

$R = \{(a, c), (b, b), (c, a)\}$ be a relation on A. Is R

- ▶ Transitive
- ▶ Reflexive
- ▶ Symmetric
- ▶ Transitive and Reflexive

Question: In Boolean addition $1+1=$

- ▶ 2
- ▶ 1 (Pg 99)
- ▶ 0

Question No: 8 (Marks: 1) - Please choose one

The same element can never appear twice in a set

- ▶ True
- ▶ False

Question No: 9 (Marks: 1) - Please choose one

If $f(x)=2x+1$, $g(x)=x^2-1$ then $fg(x)=$

- ▶ x^2-1
- ▶ $2x^2-1$

► $2x^3 - 1$

Remember Own Prayer

$$fg(x) = f(x^2 - 1)$$

$$f(x^2 - 1) = 2(x^2 - 1) + 1$$

$$= 2x^2 - 2 + 1$$

$$= 2x^2 - 1$$

Question No: 13 (Marks: 1) - Please choose one

If a set contains exactly m distinct elements where m denotes some non negative integer then the set is .

- ▶ Finite
- ▶ Infinite
- ▶ None of these

Question No: 14 (Marks: 1) - Please choose one

If $f(4) = 1$ and $g(1) = 4$ then $f \circ g(1) =$

- ▶ 3
- ▶ 1
- ▶ 4

$$f \circ g(1) = fg(1)$$

$$= f(4) = 1$$

Question No: 15 (Marks: 1) - Please choose one

If $(A \cup B) = A$, then $(A \cap B) = B$

- ▶ True
- ▶ False
- ▶ Cannot be determined

Question No: 16 (Marks: 1) - Please choose one

The total number of elements in a set is called

- ▶ Strength
- ▶ Cardinality
- ▶ Finite

Question No: 17 (Marks: 1) - Please choose one

If $f(x) = x$ and $g(x) = -2x$ then $(f+g)x =$

- ▶ $3x$
- ▶ $2x^2$
- ▶ $-x$

Question No: 19 (Marks: 1) - Please choose one

Which term of the sequence 4,1,-2,... is -77

- ▶ 26
- ▶ 27
- ▶ 28

Question No: 20 (Marks: 1) - Please choose one

If a set A has 5 elements then power set of A. P(S) contains elements. Which are?

- ▶ 5^5
- ▶ 2^n
- ▶ 4^5

2^5



Remember Own Prayer

Question No: 13 (Marks: 1) - Please choose one

Let g be the functions defined by
 $g(x) = 3x + 2$ then $g \circ g(x) =$

- ☐ $9x^2 + 4$
- ☐ $6x + 4$
- ☒ $9x + 8$

$g \circ g(x)$
 $= 3(3x + 2) + 2$
 $= 9x + 6 + 2$
 $= 9x + 8$

MTH202 Discrete Mathematics

- Question No. 1:**
If p = It is raining q = She will go to college
"It is raining and she will not go to college" will be denoted by
☒ $p \wedge \sim q$ ☐ $p \wedge q$ ☐ $\sim (p \wedge q)$ ☐ $\sim p \wedge q$
- Question No. 2:**
The negation of "Today is Friday" is
☐ Today is Saturday ☒ **Today is not Friday** ☐ Today is Thursday ☐ None of given
- Question No. 3:**
The converse of the conditional statement $p \rightarrow q$ is
☒ $q \rightarrow p$ ☐ $\sim q \rightarrow \sim p$ ☐ $\sim p \rightarrow \sim q$ ☐ None of these
- Question No. 4:**
Contra-positive of given statement "If it is raining, I will take an umbrella" is
☒ **I will not take an umbrella if it is not raining. (Pg 19)** ☐ I will take an umbrella if it is raining.
☐ It is not raining or I will take an umbrella. ☐ None of these.
- Question No. 5:**
A statement is also referred to as a
☒ **Proposition (pg 4)** ☐ Conclusion ☐ Order ☐ None of these
- Question No. 6:**
The statement "It is not raining if and only if roads are dry" is logically equivalent to
☐ If roads are dry then it is not raining. ☐ None of these.
☒ **Roads are dry if and only if it is not raining** ☐ If it is not raining then roads are dry.
- Question No. 7:**
The statement $\sim(\sim p) = p$ Describes
☐ Commutative Law ☐ Implication Laws ☒ **Double negative law** ☐ Equivalence
- Question No. 8:**
An arrangement of rows and columns that specifies the truth value of a compound proposition for all possible truth values of its constituent propositions is called
☒ **Truth Table** ☐ Venn diagram ☐ False Table ☐ None of these
- Question No. 9:**
An argument is _____ if the conclusion is true when all the premises are true.
☒ **Valid (Pg 25)** ☐ Invalid ☐ False ☐ None of these
- Question No. 10:**
The row in the truth table of an argument where all premises are true is called
☐ Valid row ☐ Invalid row ☒ **Critical row (Pg 27)** ☐ None of these

Question No. 11:

The statement $p \rightarrow q \equiv (p \wedge \sim q) \rightarrow c$ describes
☐ Commutative Law ☐ Implication Laws ☐ Exportation Law ☒ **Reductio ad absurdum**

Question No. 12:

$p \leftrightarrow q$ is logically equivalent to $(p \rightarrow q) \wedge (q \rightarrow p)$ ☐ TRUE ☐ FALSE

Question No. 13:

According to biconditional $1+1=3$ if and only if sky is yellow. ☒ **TRUE (Pg 20)** ☐ FALSE

Question No. 14:

A statement that is always true regardless of the truth values of the statement variables called Tautology.
☒ **TRUE (Pg 10)** ☐ FALSE

Question No. 15:

If p and q are statement variables, then the conjunction of p and q is “p and q” denoted as " $p \vee q$ ".
☐ TRUE ☒ **FALSE**

Question No: 3 (Marks: 1) - Please choose one
For two sets A,B

$A \cap (B \cup C) = (A \cap B) \cup (A \cap C)$ is called

- ▶ Distributivity of intersection over union
- ▶ Distributivity of union over intersection
- ▶ None of these
- ▶ **Distributivity Law**

Question No: 6 (Marks: 1) - Please choose one
Check whether

$36 \equiv 1 \pmod{5}$ 36 Modulus5 = 1 remainder

$33 \equiv 3 \pmod{10}$ 33 Modulus10 = 3 remainder

- ▶ **Both are equivalent**
- ▶ Second one is equivalent but first one is not
- ▶ First one is equivalent but second one is not

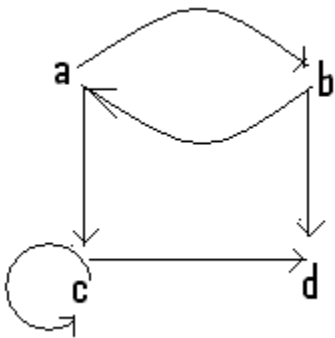
Question No: 7 (Marks: 1) - Please choose one
A binary relation R is called Partial order relation if

- ▶ It is Reflexive and transitive
- ▶ It is symmetric and transitive
- ▶ It is reflexive, symmetric and transitive
- ▶ **It is reflexive, anti-symmetric and transitive (Pg 92)**

Question No: 8 (Marks: 1) - Please choose one
The order pairs which are not present in a relation, must be present in

- ▶ Inverse of that relation
- ▶ Composition of relations
- ▶ **Complementary relation of that relation (pg 97)**

Question No: 9 (Marks: 1) - Please choose one
The relation as a set of ordered pairs as shown in figure is



- ▶ $\{(a,b),(b,a),(b,d),(c,d)\}$
- ▶ $\{(a,b),(b,a),(a,c),(b,a),(c,c),(c,d)\}$
- ▶ **$\{(a,b), (a,c), (b,a),(b,d), (c,c),(c,d)\}$**
- ▶ $\{(a,b), (a,c), (b,a),(b,d),(c,d)\}$

Question No: 10 (Marks: 1) - Please choose one
A circuit with two input signals and one output signal is called

- ▶ NOT-gate (or inverter)
- ▶ **AND- gate**
- ▶ None of these

Question No: 11 (Marks: 1) - Please choose one
If $f(x)=2x+1$ then its inverse =

- ▶ $x-1$
- ▶ **$\frac{1}{2}(x-1)$**
- ▶ $x^2 +2$

$f(x)=2x+1$
 $y=2x+1$
 $x=\frac{y-1}{2}$
 $f(x)^{-1}=\frac{y-1}{2}$

Question No: 12 (Marks: 1) - Please choose one
Null set is denoted by

- ▶ **(phi) or { }. (pg 39)**
- ▶ A
- ▶ None of these

Question No: 13 (Marks: 1) - Please choose one
The total number of elements in a set is called

- ▶ Strength
- ▶ **Cardinality (pg 141)**
- ▶ Finite

Question No: 14 (Marks: 1) - Please choose one

If $f(x) = x+1$ and $g(x) = -2x^2 + 1$ then $(2f - 1g)x =$

- ▶ $2x^2 - x$
- ▶ $3x+2$
- ▶ $2x^2 + 2x + 1$

$$= (2f - 1g)x$$

$$= 2f(x) - g(x)$$

$$= 2.(x+1) - (-2x^2 + 1)$$

$$= 2x + 2 + 2x^2 - 1$$

$$= 2x^2 + 2x + 1$$

Question No: 15 (Marks: 1) - Please choose one

Let

$$a_0 = 1, a_1 = -2 \text{ and } a_2 = 3$$

$$\text{then } \sum_{j=0}^2 a_j =$$

- ▶ -6
- ▶ **2**
- ▶ 8

Question No: 16 (Marks: 1) - Please choose one

Which of the given statement is incorrect?

- ▶ The process of defining an object in terms of smaller versions of itself is called recursion. (Pg 159)
- ▶ A recursive definition has two parts: Base and Recursion.
- ▶ **Functions cannot be defined recursively (Pg 159)**
- ▶ Sets can be defined recursively. (Pg 165)

Question No: 17 (Marks: 1) - Please choose one

The operations of intersection and union on sets are commutative

▶ **True (Pg 42)**

▶ False

▶ Depends on the sets given

Question No: 18 (Marks: 1) - Please choose one

The power set of a set A is the set of all subsets of A, denoted $P(A)$.

- ▶ False
- ▶ **True (Pg 68)**

Question No: 19 (Marks: 1) - Please choose one

What is the output state of an OR gate if the inputs are 0 and 1?

- ▶ 0
- ▶ **1**
- ▶ 2
- ▶ 3

Question No: 20 (Marks: 1) - Please choose one

The product of the positive integers from 1 to n is called

- ▶ Multiplication
- ▶ **n factorial**
- ▶ Geometric sequence

Question No: 6 (Marks: 1) - Please choose one

Let $A = \{1, 2, 3, 4\}$ and $R = \{(1, 1), (2, 2), (3, 3), (4, 4)\}$ then

- ▶ R is symmetric.
- ▶ R is anti symmetric.
- ▶ R is transitive.
- ▶ R is reflexive.
- ▶ All given options are true

Question No: 7 (Marks: 1) - Please choose one

The inverse of given relation

$R = \{(1,1),(1,2),(1,4),(3,4),(4,1)\}$ is

- ▶ $\{(1,1),(2,1),(4,1),(2,3)\}$
- ▶ $\{(1,1),(1,2),(4,1),(4,3),(1,4)\}$
- ▶ $\{(1,1),(2,1),(4,1),(4,3),(1,4)\}$ (Pg 95)

Question No: 11 (Marks: 1) - Please choose one

$$(A \cap B)^c = (A^c \cap B^c)$$

- ▶ True
- ▶ False

Question No: 13 (Marks: 1) - Please choose one

Let g be the functions defined by

$g(x) = 3x + 2$ then $g \circ g(x) =$

- ▶ $9x^2 + 4$
- ▶ $6x + 4$
- ▶ $9x + 8$

$$\begin{aligned} g(g(x)) &= g(3x + 2) \\ &= 3(3x + 2) + 2 \\ &= 9x + 6 + 2 \\ &= 9x + 8 \end{aligned}$$

Question No: 16 (Marks: 1) - Please choose one

The Common fraction for the recurring decimal 0.81 is

- ▶ $\frac{81}{100}$
- ▶ $\frac{81}{98}$
- ▶ $\frac{9}{11}$

(Pg 157)

Question No: 17 (Marks: 1) - Please choose one

A collection of rules indicating how to form new set objects from those already known to be in the set is called

- ▶ Base
- ▶ Restriction
- ▶ Recursion (Pg159)

Question No: 19 (Marks: 1) - Please choose one

The statement of the form $p \vee \sim p$ is:

- ▶ Tautology (Pg 10)
- ▶ Contradiction
- ▶ Fallacy

Question No: 20 (Marks: 1) - Please choose one

Let A,B,C be the subsets of a universal set U.

Then $(A \cup B) \cup C$ is equal to:

- ▶ $A \cap (B \cup C)$

► $A \cup (B \cap C)$

► .

► $\emptyset$

► $A \cup (B \cup C)$

Associative Law

Question: If $R = \{(a, a), (b, b), (c, c)\}$ is a relation on the set $A = \{a, b, c\}$ Then R is

- Symmetric only.
- Symmetric and reflexive only.
- Reflexive only.
- **Equivalence relation. (Pg 85)**

Question: The negation of the implication “If P is a square then P is a rectangle” is

- **If P is not a square then P is not a rectangle**
- P is not a square and P is a rectangle
- P is a square and P is not a rectangle.
- None of the above

Question: Identify the false statement

- **$0 \in \emptyset$**
- $\{\emptyset\} \subseteq \{\emptyset\}$
- If A and B are two sets $A \subseteq B$ and $B \subseteq A$ then $A = B$.
- Two sets are disjoint if their intersection is empty set.
- $A \cap A^c = \emptyset$

Question: Let A be a set containing 3 elements then the total number of relations from A to A is

- 2^9
- 2^3
- **3^3**
- $2n$

Question: Let $A = \{1, 2, 3\}$ and $B = \{2, 3, 4, 5\}$ then

- $A = B$.
- A is a subset of B .
- A is improper subset of B .
- **Both 2 and 3.**

Question: Which of the following is not a Proposition?

- **$x > 11$.**
- Sun rounds about the Earth
- $11 + 7 = 18$
- None of above.

Question: $F = \{x \in \mathbb{R} \mid x^3 + 29x + 12 = 0\}$

- **finite**
- infinite
- (c) none of above

Question: Let A has the same cardinality as B if and only if ,there is a----- correspondence between sets A and B

- one-one
- onto
- **(c) Both (a) and (b) (Pg 141)**

Question: Let $A = \{0, 1, 2, 3, 4, 5\}$ and we define functions $f: A \rightarrow A$ and then $g: A \rightarrow A$

$f(3) = 3, f(4) = 2, f(5) = 2, f(2) = 5, f(1) = 2$

$g(1) = 4, g(3) = 3, g(5) = 3, g(2) = 1$

then $f \circ g(5)$ and $g \circ f(2)$

- **(a) $f \circ g(5) = g \circ f(2)$**
- (b) $f \circ g(5) \neq g \circ f(2)$
- (c) $f \circ g(3) = g \circ f(1)$
- (d) None of the above

$$f \circ g(5) = fg(5)$$

$$= f(3) = 3$$

$$g \circ f(2) = gf(2)$$

$$= g(5) = 3$$

Question: Choose the correct answer:

If f and g are two one-to-one functions, then their composition of gof is

- onto
- **one-to-one (Pg 134)**
- (c) bijective

Question: If 1=1 then 2=2 , the conditional statement is

- **True**
- False
- None of other.

$$\text{If } 1^3 + 2^3 + 3^3 + \dots + n^3 =$$

Then,

$$\left[\frac{n(n+1)}{2} \right]^2 \quad (\text{Pg 157})$$

$$\frac{n(n+1)(2n+1)}{6}$$

$$\frac{n(n+1)}{2}$$

None of these

Question: A set Z has n elements. How many functions are from Z to Z?

- 2_n
- **$n \times n$**
- n_n
- None of the other

Question: Compute the summation

$$\sum_{i=0}^2 (i^2 + 2)$$

- 5
- 3
- 0
- **None of these.**

Question: Let $S = \{n \in \mathbb{Z} / n = (-1)^k, \text{ for some integer } k\}$

- $S = \{1\}$
- $S = \{-1\}$
- $S = \{-1, 1\}$
- None of the other

Question: If $p=T, q=T, r=F$

Then

$$((\sim p) \wedge r) \rightarrow (q \wedge r)$$

Must be

- F
- **T**
- $q \vee r$
- None of these.

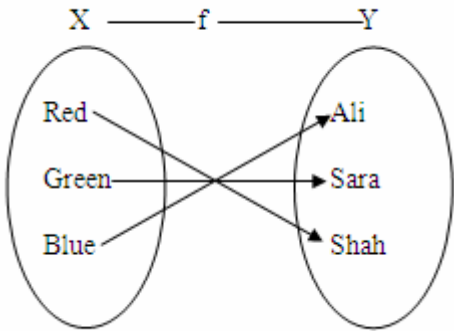
Question: If $A = \{a, b, c, d\}$ then the number of elements of power set $P(A)$ are

- 2^4
- 2^5
- 2^6
- 2^7

Question: Consider the relation $R=\{(1,1),(1,2),(1,4),(2,1),(2,2),(3,3),(4,4)\}$ on $A=\{ 1,2,3,4 \}$ is

- ▶ Symmetric
- ▶ Transitive
- ▶ **Reflexive**
- ▶ All of these

Question: The function defined by the following diagram is $f: X\rightarrow Y$



- ▶ One-to-one
- ▶ Onto
- ▶ **Both one-to-one and onto**
- ▶ None of these

Question: $1,10,10^2 ,10^3 ,10^4 ,10^5 ,10^6 ,10^7 ,.....$

is

- ▶ **Arithmetic series (Pg 145)**
- ▶ Geometric series
- ▶ Arithmetic sequence
- ▶ Geometric sequence

Question:

Negations for the given statement “The train is late or my watch is fast” is

- ▶ **The train is not late or my watch is not fast.**
- ▶ The train is not late and my watch is not fast.
- ▶ The train is not late or my watch is fast
- ▶ None of these.

Question:

Let R be the relation from $A=\{a_1,a_2,a_3\}$ (Elements of A are ordered by their subscript)to itself given by the matrix representation . Then R is

$$\begin{pmatrix} 0 & 1 & 0 \\ 1 & 0 & 1 \\ 0 & 1 & 0 \end{pmatrix}$$

- ▶ Reflexive and Symmetric.
- ▶ Symmetric and Transitive.
- ▶ **Irreflexive and Symmetric.**
- ▶ Irreflexive and Anti- Symmetric.

If out of 35 people each person like Discrete Mathematics or Data Structures ,25 like Discrete Mathematics, and 20 like Data structures then the number of people who like

both Discrete and Data Structures is.....

- ▶ 5
- ▶ 15
- ▶ 10
- ▶ None of these.

Question: Inverse of a function may not be a function

- True (Pg 124)
- False

Question No: 1 (Marks: 1) - Please choose one

The inverse of given relation $R = \{(1,1),(1,2),(1,4),(3,4),(4,1)\}$ is

- ▶ $\{(1,1),(2,1),(4,1),(2,3)\}$
- ▶ $\{(1,1),(1,2),(4,1),(4,3),(1,4)\}$
- ▶ $\{(1,1),(2,1),(4,1),(4,3),(1,4)\}$

Question No: 2 (Marks: 1) - Please choose one
Symmetric and antisymmetric are

- ▶ Negative of each other
- ▶ Both are same
- ▶ Not negative of each other (Pg 90)

Question No: 3 (Marks: 1) - Please choose one
Let $A = \{a, b, c\}$ and

$R = \{(a, c), (b, b), (c, a)\}$ be a relation on A. Is R

- ▶ Transitive
- ▶ Reflexive
- ▶ Symmetric
- ▶ Transitive and Reflexive

Question: In Boolean addition $1+1=$

- ▶ 2
- ▶ 1 (Pg 99)
- ▶ 0

Question No: 8 (Marks: 1) - Please choose one
The same element can never appear twice in a set

- ▶ True
- ▶ False

Question No: 9 (Marks: 1) - Please choose one

If $f(x)=2x+1$, $g(x)=x^2-1$ then $fg(x)=$

- ▶ x^2-1
- ▶ $2x^2-1$
- ▶ $2x^3-1$

$$fg(x) = f(x^2 - 1)$$

$$f(x^2 - 1) = 2(x^2 - 1) + 1$$

$$= 2x^2 - 2 + 1$$

$$= 2x^2 - 1$$

Question No: 13 (Marks: 1) - Please choose one

If a set contains exactly m distinct elements where m denotes some non negative integer then the set is .

► Finite

► Infinite

► None of these

Question No: 14 (Marks: 1) - Please choose one

If $f(4) = 1$ and $g(1) = 4$ then $f \circ g(1) =$

► 3

► 1

► 4

$$f \circ g(1) = fg(1)$$

$$= f(4) = 1$$

Question No: 15 (Marks: 1) - Please choose one

If $(A \cup B) = A$, then $(A \cap B) = B$

► True

► False

► Cannot be determined

Question No: 16 (Marks: 1) - Please choose one

The total number of elements in a set is called

► Strength

► Cardinality

► Finite

Question No: 17 (Marks: 1) - Please choose one

If $f(x) = x$ and $g(x) = -2x$ then $(f+g)x =$

► $3x$

► $2x^2$

► $-x$

Question No: 19 (Marks: 1) - Please choose one

Which term of the sequence $4, 1, -2, \dots$ is -77

► 26

► 27

► 28

Question No: 20 (Marks: 1) - Please choose one

If a set A has 5 elements then power set of A , $P(S)$ contains elements. Which are?

► 5^5

► 2^n

► 4^5

► 2^5

Question No: 13 (Marks: 1) - Please choose one

Let g be the functions defined by

$g(x)= 3x+2$ then $gog(x) =$

▶ $9x^2 + 4$

▶ $6x+4$

▶ **$9x+8$**

$gg(x)$

$= 3(3x + 2) + 2$

$= 9x + 6 + 2$

$= 9x + 8$

MIDTERM EXAMINATION
Spring 2010
MTH202- Discrete Mathematics (Session - 4)

Ref No: 1498325
Time: 60 min
Marks: 40

Question No: 1 (Marks: 1) - Please choose one

A statement is also referred to as a

- Proposition **p_2**
- Conclusion
- Order
- None of these

Question No: 2 (Marks: 1) - Please choose one

The converse of the conditional statement $p \rightarrow q$ is

- $q \rightarrow p$ **p_13**
- $\sim q \rightarrow \sim p$
- $\sim p \rightarrow \sim q$
- None of these

Question No: 3 (Marks: 1) - Please choose one

The statement “ It is not raining if and only if roads are dry” is logically equivalent to

- If roads are dry then it is not raining.
- None of these.
- Roads are dry if and only if it is not raining **p_16**
- If it is not raining then roads are dry.

Question No: 4 (Marks: 1) - Please choose one

Let $A = \{ a, b, c, d \}$ then the relation

$R = \{ (a, a), (b, b), (c, c), (d, c), (d, d) \}$ is?

- Symmetric
- Reflexive **p_66**
- Not reflexive
- Symmetric and Reflexive

Question No: 5 (Marks: 1) - Please choose one

Check whether

$36 \equiv 1 \pmod{5}$

$33 \equiv 3 \pmod{10}$

Note: Solve it by yourself

This VU Group is not responsible for any solved content

- Both are equivalent
- Second one is equivalent but first one is not
- First one is equivalent but second one is not

Question No: 6 (Marks: 1) - Please choose one

Let

$A = \{1, 2, 3, 4\}$ and $R = \{(1, 1), (2, 2), (3, 3), (4, 4)\}$ then

- R is symmetric.
- R is anti symmetric.
- R is transitive.
- R is reflexive. **P_66**
- All given options are true

Question No: 7 (Marks: 1) - Please choose one

The

inverse of given relation $R = \{(1, 1), (1, 2), (1, 4), (3, 4), (4, 1)\}$ is

- $\{(1, 1), (2, 1), (4, 1), (2, 3)\}$
- $\{(1, 1), (1, 2), (4, 1), (4, 3), (1, 4)\}$ **p_82**
- $\{(1, 1), (2, 1), (4, 1), (4, 3), (1, 4)\}$

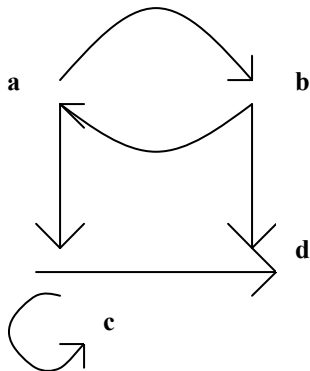
Question No: 8 (Marks: 1) - Please choose one

The statement $p \ll q \circ (p \oplus q) \cup (q \oplus p)$ describes

- Commutative Law
- Implication Laws
- Exportation Law
- Equivalence **not sure** **p_17,18**

Question No: 9 (Marks: 1) - Please choose one

The relation as a set of ordered pairs as shown in figure is



- $\{(a, b), (b, a), (b, d), (c, d)\}$

Note: Solve it by yourself

This VU Group is not responsible for any solved content

- $\{(a,b),(b,a),(a,c),(b,a),(c,c),(c,d)\}$
- $\{(a,b), (a,c), (b,a),(b,d), (c,c),(c,d)\}$ p_63
- $\{(a,b), (a,c), (b,a),(b,d),(c,d)\}$

Question No: 10 (Marks: 1) - Please choose one

If two sets are not equal, then one must be a subset of the other

- True p_29
- False

Question No: 11 (Marks: 1) - Please choose one

$$(A \cap B)^c = (A^c \cap B^c)$$

- True
- False

Question No: 12 (Marks: 1) - Please choose one

Null set is denoted by

- ϕ or $\{ \}$. P_30
- A
- None of these

Question No: 13 (Marks: 1) - Please choose one

Let g be the functions defined by

$$g(x) = 3x+2 \text{ then } g \circ g(x) =$$

- $9x+2+4$
- $6x+4$
- $9x+8$

Question No: 14 (Marks: 1) - Please choose one

If

$$f(x) = x+1 \text{ and } g(x) = -2x^2 + 1 \text{ then } (2f - 1g)x =$$

- $2x^2 - x$
- $3x+2$
- $2x^2 + 2x + 1$

$$2(x+1) - 1(-2x^2 + 1)$$

$$2x + 2 + 2x^2 - 1$$

$$2x^2 + 2x + 1$$

Question No: 15 (Marks: 1) - Please choose one

Let

Note: Solve it by yourself

This VU Group is not responsible for any solved content

$$a_0 = 1, a_1 = -2 \text{ and } a_2 = 3$$

$$\text{Then } \sum_{j=0}^2 a_j =$$

- -6
- **2**
- 8

Question No: 16 (Marks: 1) - Please choose one

The Common fraction for the recurring decimal 0.81 is

- $\frac{81}{100}$
- $\frac{81}{98}$
- $\frac{9}{11}$ **p_140**

Question No: 17 (Marks: 1) - Please choose one

A collection of rules indicating how to form new set objects from those already known to be in the set is called

- Base
- Restriction
- **Recursion** **p_147**

Question No: 18 (Marks: 1) - Please choose one

If A and B are two sets then The set of all elements that belong to A or to B or to both, is

- $A \dot{\cup} B$.
- $A \cap B$
- $A - B$
- None of these

Question No: 19 (Marks: 1) - Please choose one

The statement of the form $p \cup \sim p$ is:

- **Tautology** **p_8**
- Contradiction
- Fallacy

Question No: 20 (Marks: 1) - Please choose one

Let

A, B, C be the subsets of a universal set U.

Note: Solve it by yourself

This VU Group is not responsible for any solved content

Then $(A \cup B) \cup C$ is equal to:

- $A \cap (B \cup C)$
- $A \cup (B \cap C)$
- $\emptyset$
- $A \cup (B \cup C)$ **p_44**

Question No: 21 (Marks: 2)

Let the real valued functions f and g be defined by

$$f(x) = 2x + 1 \text{ and } g(x) = x^2 - 1$$

obtain the expression for fg(x)

Solution:

$$(f.g)(x) = f(x).g(x)$$

$$= (2x+1).(x^2-1)$$

$$= 2x^3 + x^2 - 2x - 1$$

Question No: 22 (Marks: 2)

Given $A = \{1, 2, 3, 4\}$ and $B = \{x, y, z\}$

.Let R be the following relation from A to B:

$$R = \{(1, y), (1, z), (3, y), (4, x), (4, z)\}$$

Determine the matrix of the relation.

0	1	1
0	0	0
0	1	0
1	0	1

Question No: 23 (Marks: 3)

Determine whether f is a function if

$$f(n) = \sqrt{n}$$

AN: is defined for $n < 0$, since then f results in imaginary values that is not real.

Question No: 24 (Marks: 3)

Find the 5th term of the G.P. 3, 6, 12, ...

Here $a = 3$

Common ratio = $r = 6/3 = 2$

$N = 4$

$$A_n = ar^{(n-1)}$$

$$= 3.(2)^{(4-1)}$$

$$= 3.2^3$$

$$= 3.8$$

Note: Solve it by yourself

This VU Group is not responsible for any solved content

= 24

Question No: 25 (Marks: 5)

Let f and g be the functions defined by
 $f(x) = 2x+3$ & $g(x) = 3x+2$ then find

1. Composition of f and g.
2. Composition of g and f.

Question No: 26 (Marks: 5)

Let $f : \mathbb{R} \rightarrow \mathbb{R}$ be defined by

$$f(x) = \frac{2x+1}{2x+2}$$

Is f one-to-one?

The function is not defined at $x = -1$

Hence the function is not one

According to definition of 1-1 function

$$f(x_1) = f(x_2)$$

$$(2x+1)$$

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Note: Solve it by yourself

This VU Group is not responsible for any solved content

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Question No. 1:

If p = It is raining q = She will go to college

"It is raining and she will not go to college" will be denoted by

☒ $p \wedge \sim q$ ☐ $p \wedge q$ ☐ $\sim (p \wedge q)$

☐ $\sim p \wedge q$

Question No. 2:

The negation of "Today is Friday" is

☐ Today is Saturday ☒ **Today is not Friday** ☐ Today is Thursday ☐ None of given

Question No. 3:

The converse of the conditional statement $p \rightarrow q$ is

☒ $q \rightarrow p$ ☐ $\sim q \rightarrow \sim p$ ☐ $\sim p \rightarrow \sim q$ ☐ None of these

Question No. 4:

Contra-positive of given statement "If it is raining, I will take an umbrella" is

☒ **I will not take an umbrella if it is not raining. (Pg 19)** ☐ I will take an umbrella if it is raining.
☐ It is not raining or I will take an umbrella. ☐ None

Question No. 5:

A statement is also referred to as a

☒ **Proposition (pg 4)** ☐ Conclusion ☐ Order ☐ None of these

Question No. 6:

☐ The statement "It is not raining if and only if roads are dry" is logically equivalent to If roads are dry then it is not raining.
☒ None of these.
Roads are dry if and only if it is not raining

Question No. 7:

The statement $\sim(\sim p) \rightarrow p$ Describes

☐ Commutative Law ☐ Implication Laws ☒ **Double negative law**
☐ Equivalence

Question No. 8:

An arrangement of rows and columns that specifies the truth value of a compound proposition for all possible truth values of its constituent propositions is called

☒ **Truth Table** ☐ Venn diagram ☐ False Table ☐ None of these

Question No. 9:

An argument is _____ if the conclusion is true when all the premises are true.

☒ **Valid (Pg 25)** ☐ Invalid ☐ False ☐ None of these

Question No. 10:

The row in the truth table of an argument where all premises are true is called

☐ Valid row ☐ ☒ ☐ these

Question No. 11:

The statement $p \leftrightarrow q \leftrightarrow (p \sim q) \leftrightarrow c$ describes ☐ Commutative Law ☐ Implication Laws ☐ Exportation Law
☒ **Reductio ad absurdum**

Question No. 12:

$p \wedge q$ is logically equivalent to $(p \vee q) \wedge (p \rightarrow q)$ ☐ TRUE ☐ FALSE

Question No. 13:

According to biconditional $1+1=3$ if and only if sky is yellow. ☒ **TRUE (Pg 20)** ☐

Question No. 14:

A statement that is always true regardless of the truth values of the statement variables called Tautology.
☒ **TRUE (Pg 10)** ☐
FALSE

Question No. 15:

If p and q are statement variables, then the conjunction of p and q is “p and q” denoted as " $p \wedge q$ ".
☐ TRUE ☒ **FALSE**

Question No: 3 (Marks: 1) - Please choose one
For two sets A,B

$A \cap (B \cup C) = (A \cap B) \cup (A \cap C)$ is called
▶ Distributivity of intersection over union
▶ Distributivity of union over intersection
▶ None of these
▶ **Distributivity Law**

Question No: 6 (Marks: 1) - Please choose one
Check whether

$36 \equiv 1 \pmod{5}$ 36 Modulus5 = 1 remainder
 $33 \equiv 3 \pmod{10}$ 33 Modulus10 = 3 remainder
▶ **Both are equivalent**
▶ Second one is equivalent but first one is not
▶ First one is equivalent but second one is not

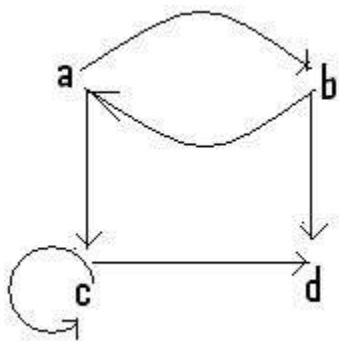
Question No: 7 (Marks: 1) - Please choose one
A binary relation R is called Partial order relation if

▶ It is Reflexive and transitive
▶ It is symmetric and transitive
▶ It is reflexive, symmetric and transitive
▶ **It is reflexive, anti-symmetric and transitive (Pg 92)**

Question No: 8 (Marks: 1) - Please choose one
The order pairs which are not present in a relation, must be present in

- ▶ Inverse of that relation
- ▶ Composition of relations
- ▶ Complementary relation of that relation (pg 97)

Question No: 9 (Marks: 1) - Please choose one
The relation as a set of ordered pairs as shown in figure is



- ▶ $\{(a,b),(b,a),(b,d),(c,d)\}$
- ▶ $\{(a,b),(b,a),(a,c),(b,a),(c,c),(c,d)\}$
- ▶ $\{(a,b), (a,c), (b,a),(b,d), (c,c),(c,d)\}$
- ▶ $\{(a,b), (a,c), (b,a),(b,d),(c,d)\}$

Question No: 10 (Marks: 1) - Please choose one
A circuit with two input signals and one output signal is called

- ▶ NOT-gate (or inverter)
- ▶ **AND- gate**
- ▶ None of these

Question No: 11 (Marks: 1) - Please choose one If $f(x)=2x+1$ then its inverse =

- ▶ $x-1$
- ▶ $\frac{1}{2}(x-1)$
- ▶ $x +2^2$

$f^{-1}(x) = \frac{x-1}{2}$
 $y = \frac{x-1}{2}$
 $x = y + 1$
 $f^{-1}(x) = \frac{x-1}{2}$

Question No: 12 (Marks: 1) - Please choose one Null set is denoted by

- ▶ **(ϕ) or $\{ \}$. (pg 39)**
- ▶ A
- ▶ None of these

Question No: 13 (Marks: 1) - Please choose one The total number of elements in a set is called

- ▶ Strength
- ▶ **Cardinality (pg 141)**
- ▶ Finite

Question No: 14 (Marks: 1) - Please choose one

If $f(x) = x + 1$ and $g(x) = \frac{1}{2}x^2 + 1$ then $(2f - 1g)x =$

► $2x^2 - x$

► $3x+2$ ►

$2x^2 - 2x - 1$

$2f - 1g - x$

$2fx - gx - 1$

$2x^2 - 1 - 2x^2 - 1$

$2x^2 - 2x^2 - 1$

$2x^2 - 2x - 1$

Question No: 15 (Marks: 1) - Please choose one

Let

$a_0 = 1, a_1 = 2 \text{ and } a_2 = 3$

then $a_j =$
 $j \geq 0$

► -6

► **2**

► 8

Question No: 16 (Marks: 1) - Please choose one Which of the given statement is incorrect?

- The process of defining an object in terms of smaller versions of itself is called recursion. (Pg 159)
- A recursive definition has two parts: Base and Recursion.
 - **Functions cannot be defined recursively (Pg 159)**
 - Sets can be defined recursively. (Pg 165)

Question No: 17 (Marks: 1) - Please choose one

The operations of intersection and union on sets are commutative

► **True (Pg 42)**

► False

► Depends on the sets given

Question No: 18 (Marks: 1) - Please choose one

The power set of a set A is the set of all subsets of A, denoted $P(A)$.

► False

► **True (Pg 68)**

Question No: 19 (Marks: 1) - Please choose one

What is the output state of an OR gate if the inputs are 0 and 1?

► 0

► **1**

► 2

► 3

Question No: 20 (Marks: 1) - Please choose one

The product of the positive integers from 1 to n is called

► Multiplication

► **n factorial**

► Geometric sequence

$A = \{1, 2, 3, 4\}$ and $R = \{(1, 1), (2, 2), (3, 3), (4, 4)\}$ then

- ▶ R is symmetric.
- ▶ R is anti symmetric.
- ▶ R is transitive.
- ▶ R is reflexive.
- ▶ All given options are true

Question No: 7 (Marks: 1) - Please choose one

The inverse of given relation
 $R = \{(1,1),(1,2),(1,4),(3,4),(4,1)\}$ is

- ▶ $\{(1,1),(2,1),(4,1),(2,3)\}$
- ▶ $\{(1,1),(1,2),(4,1),(4,3),(1,4)\}$
- ▶ $\{(1,1),(2,1),(4,1),(4,3),(1,4)\}$ (Pg 95)

Question No: 11 (Marks: 1) - Please choose one

- $(A \cup B)^c = (A^c \cap B^c)$
- ▶ True
 - ▶ False

Question No: 13 (Marks: 1) - Please choose one

Let g be the functions defined by
 $g(x)= 3x+2$ then $g \circ g(x) =$

- ▶ $9x^2 +4$
- ▶ $6x+4$
- ▶ $9x+8$

$g \circ g \circ x = 9x^2 + 12x + 4$
 $g \circ g \circ x = 9x^2 + 12x + 4$
 $g \circ g \circ x = 9x^2 + 12x + 4$
 $g \circ g \circ x = 9x^2 + 12x + 4$

Question No: 16 (Marks: 1) - Please choose one

The Common fraction for the recurring decimal 0.81 is

$\frac{81}{100}$

- ▶ $\frac{81}{98}$
- ▶ $\frac{9}{11}$

(Pg 157)

Question No: 17 (Marks: 1) - Please choose one

A collection of rules indicating how to form new set objects from those already known to be in the set is called

- ▶ Base
- ▶ Restriction
- ▶ Recursion (Pg159)

Question No: 19 (Marks: 1) - Please choose one

The statement of the form $p \rightarrow \sim p$ is:

- ▶ Tautology (Pg 10)
- ▶ Contradiction

► Fallacy

Question No: 20 (Marks: 1) - Please choose one Let

A,B,C be the subsets of a universal set U.

$$(A \cap B \cap C) \cap (A \cap B \cap C)$$

Then _____ is equal to:

$$A \cap (B \cap C)$$



- ▶ ☐
- ☐
- ▶

▶ $A \cap (B \cup C)$

Associative Law

Question: If $R = \{(a, a), (b, b), (c, c)\}$ is a relation on the set $A = \{a, b, c\}$ Then R is ☐

Symmetric only.

- Symmetric and reflexive only.
- Reflexive only.
- **Equivalence relation. (Pg 85)**

Question: The negation of the implication “If P is a square then P is a rectangle” is

- **If P is not a square then P is not a rectangle** ☐ P is not a square and P is a rectangle ☐ P is a square and P is not a rectangle.
- None of the above

Question: Identify the false statement

- **$0 \in \emptyset$**
- $\{\emptyset\} \subseteq \emptyset$
- If A and B are two sets $A \cap B$ and $B \cap A$ then $A \cap B = B \cap A$ ☐ Two sets are disjoint if their intersection is empty set.
- $A \cap A = U$

Question: Let A be a set containing 3 elements then the total number of relations from A to A is

- 2^9
- 2^3
- **n^n**
- $2n$

Question: Let $A = \{1, 2, 3\}$ and $B = \{2, 3, 4, 5\}$ then

- ☐ $A = B$.
- A is a subset of B .
- A is improper subset of B .
- **Both 2 and 3.**

Question: Which of the following is not a Proposition?

- **$x > 11$.**
- Sun rounds about the Earth
- $11 + 7 = 18$
- None of above.

Question: $F = \{x \in \mathbb{R} \mid x^3 + 29x^2 - 3 = 0\}$

- **finite**
- infinite
- (c) none of above

Question: Let A has the same cardinality as B if and only if ,there is a----- correspondence between sets A and B

- one-one
- onto
- **(c) Both (a) and (b) (Pg 141)**

Question: Let $A = \{0, 1, 2, 3, 4, 5\}$ and we define functions $f: A \rightarrow A$ and then $g: A \rightarrow A$

$f(3)=3$, $f(4)=2$, $f(5)=2$, $f(2)=5$, $f(1)=2$ $g(1)=4$, $g(3)=3$, $g(5)=3$, $g(2)=1$

then $f \circ g(5)$ and $g \circ f(2)$

- **(a) $f \circ g(5) = g \circ f(2)$**
- (b) $f \circ g(5) \neq g \circ f(2)$
- (c) $f \circ g(3) = g \circ f(1)$
- (d) None of the above

- $q \vee r$
- None of these.

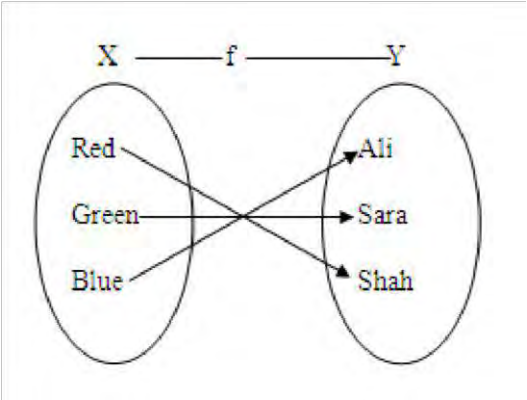
Question: If $A=\{a,b,c,d\}$ then the number of elements of power set $P(A)$ are

- 24
- 25
- 26
- 27

Question: Consider the relation $R=\{(1,1),(1,2),(1,4),(2,1),(2,2),(3,3),(4,4)\}$ on $A=\{ 1,2,3,4 \}$ is

- Symmetric
- Transitive
- **Reflexive**
- All of these

Question: The function defined by the following diagram is $f: X\rightarrow Y$



- One-to-one
- Onto
- **Both one-to-one and onto**
- None of these

Question: 11010 10 10 10 10 10, , ², ³,
 ⁴, ⁵, ⁶, ⁷,..... is

- **Arithmetic series (Pg 145)**
- Geometric series
- Arithmetic sequence
- Geometric sequence

Question:
Negations for the given statement “The train is late or my watch is fast” is

- **The train is not late or my watch is not fast.**
- The train is not late and my watch is not fast.
- The train is not late or my watch is fast
- None of these.

Question:
Let R be the relation from $A=\{a_1,a_2,a_3\}$ (Elements of A are ordered by their subscript)to itself given by the matrix representation . Then R is

☐ 0	1			
		0	☐	
☐ 1	0			
		1	☐	
☐				
☐				
☐ 0	1	0	☐	☐

☐

- ▶ Reflexive and Symmetric.
- ▶ Symmetric and Transitive.
- ▶ **Irreflexive and Symmetric.**
- ▶ Irreflexive and Anti- Symmetric.

If out of 35 people each person like Discrete Mathematics or Data Structures ,25 like

Discrete Mathematics, and 20 like Data structures then the number of people who like both Discrete and Data Structures is.....

- ▶ **5**
- ▶ 15
- ▶ 10
- ▶ None of these.

Question: Inverse of a function may not be a function

- ☐ **True (Pg 124)**
- ☐ False

Question No: 1 (Marks: 1) - Please choose one

The inverse of given relation $R = \{(1,1),(1,2),(1,4),(3,4),(4,1)\}$ is

- ▶ $\{(1,1),(2,1),(4,1),(2,3)\}$
- ▶ $\{(1,1),(1,2),(4,1),(4,3),(1,4)\}$
- ▶ **$\{(1,1),(2,1),(4,1),(4,3),(1,4)\}$**

Question No: 2 (Marks: 1) - Please choose one Symmetric and antisymmetric are

- ▶ Negative of each other
- ▶ Both are same
- ▶ **Not negative of each other (Pg 90)**

Question No: 3 (Marks: 1) - Please choose one

Let $A = \{a, b, c\}$ and $R = \{(a, c), (b, b), (c, a)\}$ be a relation on A. Is R

- ▶ Transitive
 - ▶ Reflexive
 - ▶ **Symmetric** ▶
- Transitive and Reflexive

Question: In Boolean addition $1+1=$

- ▶ 2
- ▶ **1 (Pg 99)**
- ▶ 0

Question No: 8 (Marks: 1) - Please choose one

The same element can never appear twice in a set

- ▶ True
- ▶ **False**

Question No: 9 (Marks: 1) - Please choose one

$g(x)=x^{-1^2}$

If $f(x)=2x+1$, then $fg(x)=$

- ▶ x^{-12}
- ▶ **$2x^2-1$**
- ▶ $2x^3-1$

$fg(x) = (2x+1)x^{-2} = \frac{2x+1}{x^2} = \frac{2x}{x^2} + \frac{1}{x^2} = \frac{2}{x} + \frac{1}{x^2}$

Question No: 13 (Marks: 1) - Please choose one

If a set contains exactly m distinct elements where m denotes some non negative integer then the set is .

- ▶ **Finite**
- ▶ Infinite
- ▶ None of these

Question No: 14 (Marks: 1) - Please choose one If $f(4) = 1$ and $g(1) = 4$ then $fog(1) =$

- ▶ 3
- ▶ **1**
- ▶ 4

$fog(1) = f(g(1)) = f(4) = 1$

Question No: 15 (Marks: 1) - Please choose one If $(A \cap B) = A$, then $(A \cap B) = B$

- ▶ **True**
- ▶ False
- ▶ Cannot be determined

Question No: 16 (Marks: 1) - Please choose one

The total number of elements in a set is called

- ▶ Strength
- ▶ **Cardinality**
- ▶ Finite

Question No: 17 (Marks: 1) - Please choose one
If $f(x) = x$ and $g(x) = -2x$ then $(f+g)x =$

- ▶ $3x$
- ▶ $2x^2$
- ▶ **$-x$**

Question No: 19 (Marks: 1) - Please choose one

Which term of the sequence $4, 1, -2, \dots$ is -77

- ▶ **26**
- ▶ 27
- ▶ 28

Question No: 20 (Marks: 1) - Please choose one

If a set A has 5 elements then power set of A, $P(S)$ contains elements. Which are?

- ▶ 55
 - ▶ $2n$
 - ▶ **2^5**
 - ▶ 45
-

Question No: 13 (Marks: 1) - Please choose one

Let g be the functions defined by
 $g(x)= 3x+2$ then $gog(x) =$

- ☐ $9x^2 + 4$
- ☐ $6x+4$
- ☒ $9x+8$

$gg\ x =$
 $3^3\ 2^2\ x =$
 $9\ 6\ 2x$
 $9\ 8x$

MIDTERM EXAMINATION
Spring 2010
MTH202- Discrete Mathematics (Session - 4)

Ref No: 1498325
Time: 60 min
Marks: 40

Question No: 1 (Marks: 1) - Please choose one

A statement is also referred to as a

- Proposition **p_2**
- Conclusion
- Order
- None of these

Question No: 2 (Marks: 1) - Please choose one

The converse of the conditional statement $p \rightarrow q$ is

- $q \rightarrow p$ **p_13**
- $\sim q \rightarrow \sim p$
- $\sim p \rightarrow \sim q$
- None of these

Question No: 3 (Marks: 1) - Please choose one

The statement “ It is not raining if and only if roads are dry” is logically equivalent to

- If roads are dry then it is not raining.
- None of these.
- Roads are dry if and only if it is not raining **p_16** ☐ If it is not raining then roads are dry.

Question No: 4 (Marks: 1) - Please choose one

Let $A = \{ a, b, c, d \}$ then the relation

$R = \{ (a, a), (b, b), (c, c), (d, c), (d, d) \}$ is?

- Symmetric
- Reflexive **p_66**
- Not reflexive
- Symmetric and Reflexive

Question No: 5 (Marks: 1) - Please choose one

Check whether

$$36 \equiv 1 \pmod{5} \quad 33 \equiv 3$$

$\pmod{10}$ ☐ Both are equivalent

- Second one is equivalent but first one is not
- First one is equivalent but second one is not

Question No: 6 (Marks: 1) - Please choose one Let

$A = \{1, 2, 3, 4\}$ and $R = \{(1, 1), (2, 2), (3, 3), (4, 4)\}$ then ☐ R is symmetric.

- R is anti symmetric.
- R is transitive.
- R is reflexive. **P_66**
- All given options are true

Question No: 7 (Marks: 1) - Please choose one

The

inverse of given relation $R = \{(1,1),(1,2),(1,4),(3,4),(4,1)\}$ is

- $\{(1,1),(2,1),(4,1),(2,3)\}$
- $\{(1,1),(1,2),(4,1),(4,3),(1,4)\}$ **p_82**
- $\{(1,1),(2,1),(4,1),(4,3),(1,4)\}$

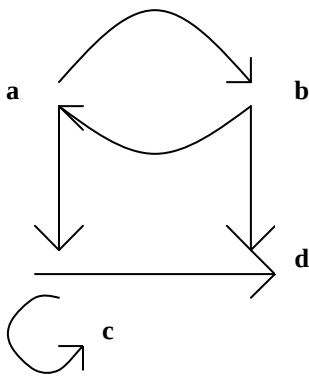
Question No: 8 (Marks: 1) - Please choose one

The statement $p \ll q \circ (p \otimes q) \dot{\cup} (q \otimes p)$ describes

- Commutative Law
- Implication Laws $\square$ Exportation Law
- Equivalence **not sure** **p_17,18**

Question No: 9 (Marks: 1) - Please choose one

The relation as a set of ordered pairs as shown in figure is



- $\{(a,b),(b,a),(b,d),(c,d)\}$
- $\{(a,b),(b,a),(a,c),(b,a),(c,c),(c,d)\}$
- $\{(a,b), (a,c), (b,a),(b,d), (c,c),(c,d)\}$ **p_63**
- $\{(a,b), (a,c), (b,a),(b,d),(c,d)\}$

Question No: 10 (Marks: 1) - Please choose one

If two sets are not equal, then one must be a subset of the other

- True **p_29**
- False

Question No: 11 (Marks: 1) - Please choose one

$$(A \cup B)^c = (A^c \cap B^c)$$

- True
- False

Question No: 12 (Marks: 1) - Please choose one

Null set is denoted by

- (ϕ) or $\{ \}$. **P_30** $\square$ A
- None of these

Question No: 13 (Marks: 1) - Please choose one

Let g be the functions defined by

$$g(x) = 3x+2 \text{ then } g \circ g(x) =$$

- $9x^2 + 4$
- $6x + 4$
- $9x + 8$

Question No: 14 (Marks: 1) - Please choose one

If

$f(x) = x + 1$ and $g(x) = -2x^2 + 1$ then $(2f - 1g)x =$

- $2x^2 - x - 3x + 2$
- $2x^2 + 2x + 1$

$$2(x+1) - 1(-2x^2 + 1)$$

$$2x + 2 + 2x^2 - 1 = 2x^2 + 2x + 1$$

Question No: 15 (Marks: 1) - Please choose one

Let

$$a_0 = 1, a_1 = -2 \text{ and } a_2 = 3$$

Then $a_{\sum_{j=0}} =$

- -6
- 2
- 8

Question No: 16 (Marks: 1) - Please choose one

The Common fraction for the recurring decimal 0.81 is

- $\frac{81}{100}$
- $\frac{81}{98}$
- $\frac{9}{11}$ p_140

Question No: 17 (Marks: 1) - Please choose one

A collection of rules indicating how to form new set objects from those already known to be in the set is called

- Base
- Restriction
- Recursion p_147

Question No: 18 (Marks: 1) - Please choose one

If A and B are two sets then The set of all elements that belong to A or to B or to both, is

- $A \cap B$.
- $A \subset B$
- $A \cup B$
- None of these

Question No: 19 (Marks: 1) - Please choose one The statement of the form $p \vee \sim p$ is:

- Tautology p_8
- Contradiction

➤ Fallacy

Question No: 20 (Marks: 1) - Please choose one Let

A,B,C be the subsets of a universal set U.

Then $(A \cup B) \cap C$ is equal to:

- $A \cap (B \cup C)$
- $A \cup (B \cap C)$
- $\emptyset$
- $A \cup (B \cap C)$ **p_44**

Question No: 21 (Marks: 2)

Let the real valued functions f and g be defined by $f(x) = 2x + 1$ and $g(x) = x^2 - 1$

obtain the expression for fg(x)

Solution:

$$(f.g)(x) = f(x).g(x)$$

$$= (2x+1).(x^2-1)$$

$$= 2x^3 + x^2 - 2x - 1$$

Question No: 22 (Marks: 2)

Given $A = \{1, 2, 3, 4\}$ and $B = \{x, y, z\}$

.Let R be the following relation from A to B:

$R = \{(1, y), (1, z), (3, y), (4, x), (4, z)\}$ Determine the matrix of the relation.

$$\begin{matrix} & 1 & 2 & 3 & 4 \\ 1 & 0 & 1 & 1 & 0 \\ 2 & 0 & 0 & 0 & 0 \\ 3 & 0 & 1 & 0 & 0 \\ 4 & 1 & 0 & 1 & 1 \end{matrix}$$

Question No: 23 (Marks: 3)

Determine whether f is a function if $f(\sqrt{n}) = n$

AN: is defined for $n < 0$, since then f results in imaginary values that is not real.

Question No: 24 (Marks: 3)

Find the 5th term of the G.P. 3, 6, 12, ...

Here $a = 3$

Common ratio = $r = 6/3 = 2$ $N = 4$

$$A_n = ar^{(n-1)}$$

$$= 3.(2)^{(4-1)}$$

$$= 3.2^3$$

$$= 3.8$$

$$= 24$$

Question No: 25 (Marks: 5) Let f and g be the functions defined by

$f(x) = 2x+3$ & $g(x) = 3x+2$ then find

1. Composition of f and g.
2. Composition of g and f.

Question No: 26 (Marks: 5) Let $f : \mathbb{R} \rightarrow \mathbb{R}$ be defined by

$$f(x) = \frac{2x+1}{2x+2}$$

Is f one-to-one?

The function is not defined at $x = -1$ Hence the function is not one According to definition of 1-1 function $f(x_1) = f(x_2) \Rightarrow (2x_1+1) = (2x_2+1)$

MTH202- Discrete Mathematics MIDTERM EXAMINATION

Time: 60 min
Marks: 40

Question No: 1 (Marks: 1) - Please choose one

The negation of “Today is Friday” is

- Today is Saturday
- Today is not Friday **p_3**
- Today is Thursday

Question No: 2 (Marks: 1) - Please choose one

An arrangement of rows and columns that specifies the truth value of a compound proposition for all possible truth values of its constituent propositions is called

- Truth Table **p_4**
- Venn diagram
- False Table
- None of these

Question No: 3 (Marks: 1) - Please choose one

For two sets A,B

$A \cap (B \cup C) = (A \cap B) \cup (A \cap C)$ is called

- Distributivity of intersection over union
- Distributivity of union over intersection
- Distributivity Law **p_44**
- None of these

Question No: 4 (Marks: 1) - Please choose one

An argument is _____ if the conclusion is true when all the premises are true.

- Valid **p_19**
- Invalid
- False
- None of these

Question No: 5 (Marks: 1) - Please choose one

The row in the truth table of an argument where all premises are true is called

- Valid row
- Invalid row
- **Critical row** p_19
- None of these

Question No: 6 (Marks: 1) - Please choose one

Check whether

$$36 \equiv 1 \pmod{5} \qquad 36 \text{ Modulus } 5 = 1 \text{ remainder}$$

$$33 \equiv 3 \pmod{10} \qquad 33 \text{ Modulus } 10 = 3 \text{ remainder}$$

- Both are equivalent
- Second one is equivalent but first one is not
- First one is equivalent but second one is not

Question No: 7 (Marks: 1) - Please choose one

A binary relation R is called Partial order relation if

- It is Reflexive and transitive
- It is symmetric and transitive
- It is reflexive, symmetric and transitive
- **It is reflexive, antisymmetric and transitive** p_79

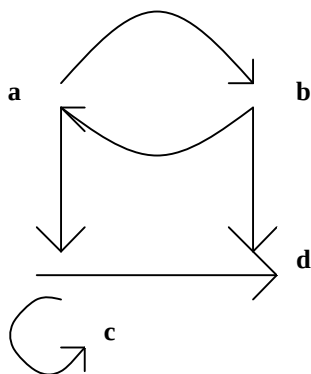
Question No: 8 (Marks: 1) - Please choose one

The order pairs which are not present in a relation, must be present in

- Inverse of that relation
- Composition of relations
- **Complementary relation of that relation** p_84

Question No: 9 (Marks: 1) - Please choose one

The relation as a set of ordered pairs as shown in figure is



- $\{(a,b),(b,a),(b,d),(c,d)\}$
- $\{(a,b),(b,a),(a,c),(b,a),(c,c),(c,d)\}$
- **$\{(a,b), (a,c), (b,a),(b,d), (c,c),(c,d)\}$** p_63
- $\{(a,b), (a,c), (b,a),(b,d),(c,d)\}$

Question No: 10 (Marks: 1) - Please choose one

A circuit with two input signals and one output signal is called

- NOT-gate (or inverter)
- **AND- gate** p_22
- None of these

Question No: 11 (Marks: 1) - Please choose one

If $f(x)=2x+1$ then its inverse =

- $x-1$
- $\frac{1}{2}(x-1)$ **not sure** **p_112**
- x^2-2

Question No: 12 (Marks: 1) - Please choose one

Null set is denoted by

- (ϕ) or $\{ \}$. **P_30**
- A
- None of these

Question No: 13 (Marks: 1) - Please choose one

The total number of elements in a set is called

- Strength
- Cardinality
- Finite **p_31**

Question No: 14 (Marks: 1) - Please choose one

If $f(x) = x+1$ and $g(x) = x^2 - 1$ then $(2f - 1g)x =$

- $2x^2 - x$
- $3x+2$
- $2x^2 - x^2 - 2x - 1$

$$2(x+1) - 1(x^2 - 1) = 2x + 2 - x^2 + 1 = -x^2 + 2x + 3$$

Question No: 15 (Marks: 1) - Please choose one

Let

$$a_0 = 1, a_1 = 2 \text{ and } a_2 = 3$$

$$\text{Then } a_j = j^2$$

- -6
- 2
- 8

Question No: 16 (Marks: 1) - Please choose one Which of the given statement is incorrect?

- The process of defining an object in terms of smaller versions of itself is called recursion.
- A recursive definition has two parts: Base and Recursion. ☐ Functions cannot be defined recursively ☐ Sets can be defined recursively.

Question No: 17 (Marks: 1) - Please choose one

The operations of intersection and union on sets are commutative

- True **p_44**
- False
- Depends on the sets given

Question No: 18 (Marks: 1) - Please choose one

The power set of a set A is the set of all subsets of A, denoted $P(A)$.

- False
- True **p_58**

Question No: 19 (Marks: 1) - Please choose one

What is the output state of an OR gate if the inputs are 0 and 1?

- 0
- ☒ 1
- 2
- 3

p_22

Question No: 20 (Marks: 1) - Please choose one

The product of the positive integers from 1 to n is called

- Multiplication
- n factorial
- Geometric sequence

Question No: 21 (Marks: 2)

Let

R be the relation on from A to B as

$$R = \{(1, y), (2, x), (2, y), (3, x)\}$$

Find

- (a) domain of R
- (b) range of R

Question No: 22 (Marks: 2)

Missing

Question No: 23 (Marks: 3)

Suppose that R and S are reflexive relations on a set A. Prove or disprove $R \circ S$ is reflexive.

Question No: 24 (Marks: 3)

Find the sum of the infinite G.P.

$$2, \sqrt{2}, 1, \dots$$

Question No: 25 (Marks: 5)

$$f(x) = \frac{x^3}{2} \text{ and } g(x) = \frac{x^2}{4}$$

then find the value of

$$5f(2) - 7g(4)$$

Question No: 26 (Marks: 5)

Write the geometric sequence with positive terms whose second term is 9 and fourth term is 1.

	Discrete Mathematics MTH 202 Semester Fall 2004	Total Marks: 40 Time: 60 min
Instructions Please read the following instructions carefully before attempting any question: 1. The duration of this examination is 60 minutes. 2. This examination is closed book, closed notes, closed neighbors. 3. Answer all questions. 4. Do not ask any questions about the contents of this examination from anyone and if you feel that there is something wrong with any question then made the best assumptions which you think and then answer that question. 5. Calculator is allowed		
Question No: 1	:	Marks
: 2		
If $R = \{ (a, a), (b, b), (c, c) \}$ is a relation on the set $A = \{a, b, c\}$ Then R is a) Symmetric only. b) Symmetric and reflexive only. c) Reflexive only. d) Equivalence . relation		
Question No: 2		
Marks : 2		
The negation of the implication “If P is a square then P is a rectangle” is 1. If P is not a square then P is not a rectangle 2. P is not a square and P is a rectangle 3. P is a square and P is not a rectangle. 4. None of the above		

MIDTERM EXAMINATION

Fall 2009

MTH202- Discrete Mathematics

Question No: 1 (Marks: 1) - Please choose one

The inverse of given relation $R = \{(1,1),(1,2),(1,4),(3,4),(4,1)\}$ is

- ▶ $\{(1,1),(2,1),(4,1),(2,3)\}$
- ▶ $\{(1,1),(1,2),(4,1),(4,3),(1,4)\}$
- ▶ $\{(1,1),(2,1),(4,1),(4,3),(1,4)\}$

Question No: 2 (Marks: 1) - Please choose one

Symmetric and antisymmetric are

- ▶ Negative of each other
- ▶ Both are same
- ▶ Not negative of each other

Question No: 3 (Marks: 1) - Please choose one

Let $A = \{a, b, c\}$ and

$R = \{(a, c), (b, b), (c, a)\}$ be a relation on A . Is R

► Transitive

► Reflexive

► Symmetric

► Transitive and Reflexive

Question No: 4 (Marks: 1) - Please choose one

Let $A = \{1, 2, 3, 4\}$ and $R = \{(1, 1), (2, 2), (3, 3), (4, 4)\}$ then

► R is symmetric.

► R is anti symmetric.

► R is transitive.

► R is reflexive.

► All given options are true

Question No: 5 (Marks: 1) - Please choose one

The contrapositive of the conditional statement $p \rightarrow q$ is

▶ $\sim p \vee \sim q$

▶ $q \vee p$

▶ $\sim q \rightarrow \sim p$

▶ None of these

Question No: 6 (Marks: 1) - Please choose one

In Boolean addition $1+1=$

▶ 2

▶ 1

▶ 0

Question No: 7 (Marks: 1) - Please choose one

The negation of “Today is Friday” is

▶ Today is Saturday

▶ Today is not Friday

▶ Today is Thursday

Question No: 8 (Marks: 1) - Please choose one

The same element can never appear twice in a set.

► **True**

► False

Question No: 9 (Marks: 1) - Please choose one

If $f(x)=2x+1$, $g(x)=x^2-1$ then $fg(x)=$

► x^2-1

► **$2x^2-1$**

► $2x^3-1$

Question No: 10 (Marks: 1) - Please choose one

The statement $(p \vee q) \wedge \sim p \vee q \vee \sim(p \vee \sim q)$ describes

► Commutative Law

► Implication Laws

▶ Exportation Law

▶ Equivalence

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▶ True

▶ False

Question No: 12 (Marks: 1) - Please choose one

If f and g are two one-to-one functions then their composition that is $g \circ f$ is

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▶ Onto

▶ One-to-one

▶ Onto and one-to-one

Question No: 13 (Marks: 1) - Please choose one

If a set contains exactly m distinct elements where m denotes some non negative integer then the set is .

▶ Finite

▶ Infinite

▶ None of these

Question No: 14 (Marks: 1) - Please choose one

If $f(4) = 1$ and $g(1) = 4$ then $f \circ g(1) =$

▶ 3

▶ 1

▶ 4

Question No: 15 (Marks: 1) - Please choose one

If $(A \cup B) = A$, then $(A \cap B) = B$

▶ True

▶ False

▶ Cannot be determined

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If $f(x) = x$ and $g(x) = -2x$ then $(f+g)x =$

▶ $3x$

▶ $2x^2$

▶ $-x$

Question No: 18 (Marks: 1) - Please choose one

Associative law of Intersection for three sets

► $A \cup (B \cap C) = (A \cup B) \cap C$

► $A \cap (B \cap C) = (A \cap B) \cap C$

► $A \cup (B \cap C) = (A \cup B) \cup (A \cap B)$

► None of these

Question No: 19 (Marks: 1) - Please choose one

Which term of the sequence 4,1,-2,... is -77

► 26

► 27

► 28

Question No: 20 (Marks: 1) - Please choose one

If a set A has 5 elements then power set of A, P(S) contains elements. Which are?

► 5^5

► 2^n

► 4^5

▶ 2^5

Question No: 21 (Marks: 1) - Please choose one

A collection of rules indicating how to form new set objects from those already known to be in the set is called

▶ Base

▶ Restriction

▶ **Recursion**

Question No: 22 (Marks: 1) - Please choose one

$1, 10, 10^2, 10^3, 10^4, 10^5, 10^6, 10^7, \dots$ is

▶ Arithmetic series

Arithmetic series

▶ **Geometric series**

▶ Arithmetic sequence

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Question No: 23 (Marks: 1) - Please choose one

$$\sum_{j=1}^3 (3j - 5) =$$

▶ 4

▶ 3

▶ -2

Question No: 24 (Marks: 1) - Please choose one

The product of the positive integers from 1 to n is called

▶ Multiplication

▶ n factorial

▶ Geometric sequence

Question No: 25 (Marks: 3)

Consider the geometric progression $5/7, 5/49, 5/343, \dots$

- Identify r
- Find the n th term of this progression
- If the above progression is to be added up to infinite terms then what could be the sum?

Answer:-

$r = ?$

$$r = \frac{a_2}{a_1}$$

$$r = 49/7 \div 5/7$$

$$r = \frac{49}{7} \times \frac{7}{5}$$

$$r = \frac{49}{5}$$

n th term = ?

$$a_1 = 5/7$$

$$r = 49/5$$

$$a_n = ?$$

Formula

$$a_n = a_1 r^{n-1}$$

$$a_n = (5/7)(49/5)^{n-1}$$

Sum = ?

As $n \geq 1$ □

So, formula is:-

$$S_n = \frac{a(1-r)}{1-r}$$

$$S_n = \frac{5/7(1-49/5)}{1-49/5}$$

$$S_n = \frac{5/7(\frac{5-49}{5})}{\frac{1-49}{5}}$$

$$S_n = \frac{5/7(\frac{-44}{5})}{\frac{-48}{5}} = \frac{5}{7} \times \frac{44}{48}$$

$$S_n = \frac{5 \times 44}{7 \times 48} = \frac{5 \times 11}{7 \times 12} = \frac{55}{84}$$

$$S_n = \frac{55}{84}$$

Question No: 26 (Marks: 5)

Determine whether the following statement is tautology or not (use truth table)

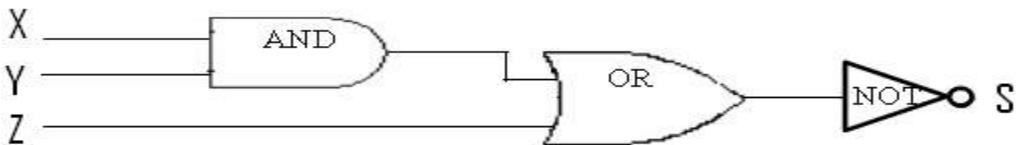
$\sim q \vee (q \rightarrow p) \rightarrow \sim p$

p	q	$\sim p$	$\sim q$	$q \rightarrow p$	$\sim q \vee (q \rightarrow p)$	$\sim q \vee (q \rightarrow p) \rightarrow \sim p$
1	1	0	0	1	1	0
1	0	0	1	1	1	0
0	1	1	0	0	0	1
0	0	1	1	1	1	1

Hence, it is not a tautology as there are two false.

Question No: 27 (Marks: 10)

Write an input/output table for the circuit:



Input signals are:

$X = 1$

$Y = 0$

$Z = 0$

X	Y	Z	$X \wedge Y$	$(X \wedge Y) \vee Z$	$\sim [(X \wedge Y) \vee Z]$
1	0	0	0	0	1

$a_{10} = a_1 + (10-1)d$ $a_{10} = \frac{-212}{17} + 9(\frac{-30}{17})$ $a_{10} = \frac{-212 - 270}{17}$ $a_{10} = \frac{-482}{17}$ <u>Marks distribution</u> 1 marks for using formula 1 marks for substituting values in the formula 1 marks for solving the equation 1 marks for finding the correct values of d and a1 1 marks for the answer	COMPOSED BY SADIA ALI SA D

Question No: 11	Marks : 5
Suppose that the relation R on a set is represented by the matrix $M_R = \begin{bmatrix} 1 & 0 & 0 \\ 1 & 1 & 1 \\ 0 & 1 & 1 \end{bmatrix}$ Is R reflexive, symmetric, and/or anti symmetric? <u>Solution:</u> Since all the diagonal elements of this matrix are equal to 1, R is reflexive. Moreover, since M_R is symmetric because $M_R = M_R^t$, it follows that R is symmetric. But R is not anti symmetric. <u>Marks distribution</u> 2 marks for reflexive 2 marks for symmetric 1 marks for anti symmetric	

MIDTERM EXAMINATION
Fall 2009
MTH202- Discrete Mathematics

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$$r = \frac{49/7}{5/7}$$

$$r = \frac{49}{7} \times \frac{7}{5}$$

$$r = \frac{49}{5}$$

n th term=?

$$a_1 = 5/7$$

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$$a_n = ?$$

Formula

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$$\text{As } n \geq 1 \square$$

So, formula is:-

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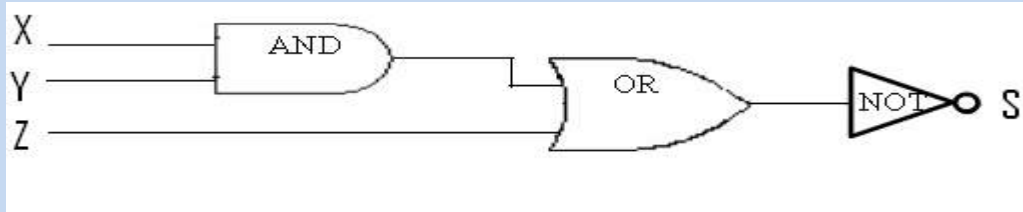
$$\sim q \vee (q \rightarrow p) \rightarrow \sim p$$

p	q	$\sim p$	$\sim q$	$q \rightarrow p$	$\sim q \vee (q \rightarrow p)$	$\sim q \vee (q \rightarrow p) \rightarrow \sim p$
1	1	0	0	1	1	0
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X	Y	Z	$X \wedge Y$	$(X \wedge Y) \vee Z$	$\sim[(X \wedge Y) \vee Z]$
1	0	0	0	0	1

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MTH202 - Discrete Mathematics

Question No: 1 (Marks: 1) - Please choose one

The inverse of given relation $R = \{(1,1),(1,2),(1,4),(3,4),(4,1)\}$ is

- ▶ $\{(1,1),(2,1),(4,1),(2,3)\}$
- ▶ $\{(1,1),(1,2),(4,1),(4,3),(1,4)\}$
- ▶ $\{(1,1),(2,1),(4,1),(4,3),(1,4)\}$

Question No: 2 (Marks: 1) - Please choose one

Symmetric and antisymmetric are

- ▶ Negative of each other
- ▶ Both are same
- ▶ Not negative of each other

Question No: 3 (Marks: 1) - Please choose one

Let $A = \{a, b, c\}$ and

$R = \{(a, c), (b, b), (c, a)\}$ be a relation on A. Is R

- ▶ Transitive
- ▶ Reflexive
- ▶ Symmetric
- ▶ Transitive and Reflexive

Question No: 4 (Marks: 1) - Please choose one

Let $A = \{1, 2, 3, 4\}$ and $R = \{(1, 1), (2, 2), (3, 3), (4, 4)\}$ then

- ▶ R is symmetric.
- ▶ R is anti symmetric.
- ▶ R is transitive.
- ▶ R is reflexive.
- ▶ All given options are true

Question No: 5 (Marks: 1) - Please choose one

The contrapositive of the conditional statement $p \rightarrow q$ is

- ▶ $\sim p \rightarrow \sim q$
- ▶ $q \rightarrow p$
- ▶ $\sim q \rightarrow \sim p$
- ▶ None of these

Question No: 6 (Marks: 1) - Please choose one

In Boolean addition $1+1=$

- ▶ 2
- ▶ 1
- ▶ 0

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Question No: 7 (Marks: 1) - Please choose one

The negation of "Today is Friday" is

- ▶ Today is Saturday
- ▶ **Today is not Friday**
- ▶ Today is Thursday

Question No: 8 (Marks: 1) - Please choose one

The same element can never appear twice in a set.

- ▶ **True**
- ▶ False

Question No: 9 (Marks: 1) - Please choose one

If $f(x)=2x+1$, $g(x)=x^2-1$ then $fg(x)=$

- ▶ x^2-1
- ▶ **$2x^2-1$**
- ▶ $2x^3-1$

Question No: 10 (Marks: 1) - Please choose one

The statement $p \sqcap q \sqcap \sim p \sqcap q \sqcap \sim(p \sqcup \sim q)$ describes

- ▶ Commutative Law
- ▶ Implication Laws
- ▶ Exportation Law
- ▶ Equivalence

Question No: 11 (Marks: 1) - Please choose one

If two sets are not equal, then one must be a subset of the other

- ▶ **True**
- ▶ False

Question No: 12 (Marks: 1) - Please choose one

If f and g are two one-to-one functions then their composition that is $g \circ f$ is

- ▶ Not one-to-one
- ▶ Onto
- ▶ **One-to-one**
- ▶ Onto and one-to-one

Question No: 13 (Marks: 1) - Please choose one

If a set contains exactly m distinct elements where m denotes some non negative integer then the set is .

- ▶ **Finite**
- ▶ Infinite

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► None of these

Question No: 14 (Marks: 1) - Please choose one

If $f(4) = 1$ and $g(1) = 4$ then $f \circ g(1) =$

- 3
- 1
- 4

Question No: 15 (Marks: 1) - Please choose one

If $(A \cup B) = A$, then $(A \cap B) = B$

- True
- False

Question No: 16 (Marks: 1) - Please choose one

The total number of elements in a set is called

- Strength
- Cardinality
- Finite

Question No: 17 (Marks: 1) - Please choose one

If $f(x) = x$ and $g(x) = -2x$ then $(f+g)x =$

- $3x$
- $2x^2$
- $-x$

Question No: 18 (Marks: 1) - Please choose one

Associative law of Intersection for three sets

- $A \cap (B \cap C) = (A \cap B) \cap C$
- $A \cap (B \cap C) = (A \cap B) \cap C$
- $A \cap (B \cap C) = (A \cap B) \cap (A \cap C)$
- None of these

Question No: 19 (Marks: 1) - Please choose one

Which term of the sequence 4, 1, -2, ... is -77

- 26
- 27
- 28

Question No: 20 (Marks: 1) - Please choose one

If a set A has 5 elements then power set of A, $P(S)$ contains elements. Which are?

- 5^5
- 2^n

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▶ 4^5

▶ 2^5

Question No: 21 (Marks: 1) - Please choose one

A collection of rules indicating how to form new set objects from those already known to be in the set is called

▶ Base

▶ Restriction

▶ Recursion

Question No: 22 (Marks: 1) - Please choose one

$1, 10, 10^2, 10^3, 10^4, 10^5, 10^6, 10^7, \dots$ is

▶ Arithmetic series

▶ Geometric series

▶ Arithmetic sequence

▶ Geometric sequence

Question No: 23 (Marks: 1) - Please choose one

$$\sum_{j=1}^3 (3j - 5) =$$

▶ 4

▶ 3

▶ -2

Question No: 24 (Marks: 1) - Please choose one

The product of the positive integers from 1 to n is called

▶ Multiplication

▶ n factorial

▶ Geometric sequence

Question No: 25 (Marks: 3)

Show that the following argument form is invalid:

$p \rightarrow q$

q

$\therefore p$

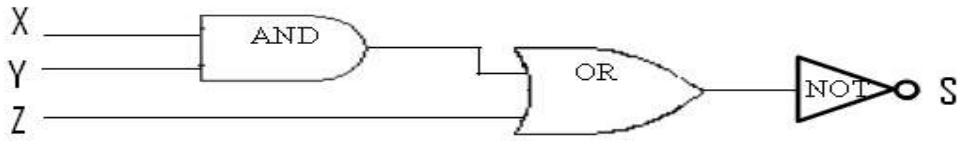
Question No: 26 (Marks: 5)

Construct a truth table which shows the conjunction between A and B.

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Question No: 27 (Marks: 10)

Write an input/output table for the circuit:



Input signals are:

X = 1

Y = 0

Z = 0

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MTH202 - Discrete Mathematics

Question: If $R = \{(a, a), (b, b), (c, c)\}$ is a relation on the set $A = \{a, b, c\}$ Then R is

- Symmetric only.
- Symmetric and reflexive only.
- Reflexive only.
- **Equivalence relation. (Pg 85)**

Question: The negation of the implication "If P is a square then P is a rectangle" is

- **If P is not a square then P is not a rectangle**
- P is not a square and P is a rectangle
- P is a square and P is not a rectangle.
- None of the above

Question: Identify the false statement

- **$0 \in \emptyset$**
- $\{\emptyset\} \subseteq \{\emptyset\}$
- If A and B are two sets $A \cap B$ and $B \cap A$ then $A \cap B = B \cap A$
- Two sets are disjoint if their intersection is empty set.
- $A \cap A^c = \emptyset$

Question: Let A be a set containing 3 elements then the total number of relations from A to A is

- 2^9
- 2^3
- **3^3**
- $2n$

Question: Let $A = \{1, 2, 3\}$ and $B = \{2, 3, 4, 5\}$ then

- $A \subseteq B$.
- A is a subset of B .
- A is improper subset of B .
- **Both 2 and 3.**

Question: Which of the following is not a Proposition?

- **$x > 11$.**
- Sun rounds about the Earth
- $11 + 7 = 18$
- None of above.

Question: $F = \{x \in \mathbb{R} \mid x^3 + 29x^2 - 3 = 0\}$

- **finite**
- infinite
- (c) none of above

Question: Let A has the same cardinality as B if and only if ,there is a----- correspondence between sets A and B

- one-one
- onto
- **(c) Both (a) and (b) (Pg 141)**

Question: Let $A = \{0, 1, 2, 3, 4, 5\}$ and we define functions $f: A \rightarrow A$ and then $g: A \rightarrow A$

$f(3)=3, f(4)=2, f(5)=2, f(2)=5, f(1)=2$

$g(1)=4, g(3)=3, g(5)=3, g(2)=1$

then $f \circ g(5)$ and $g \circ f(2)$

- **(a) $f \circ g(5) = g \circ f(2)$**
- (b) $f \circ g(5) \neq g \circ f(2)$
- (c) $f \circ g(3) = g \circ f(1)$
- (d) None of the above

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Question: If $1=1$ then $2=2$, the conditional statement is

- True
- False
- None of other.

If $1^3 + 2^3 + 3^3 + \dots + n^3 =$

Then,

$$\left[\frac{n(n+1)}{2} \right]^2 \quad (\text{Pg 157})$$

$$\frac{n(n+1)(2n+1)}{6}$$

$$\frac{n(n+1)}{2}$$

None of these

Question: A set Z has n elements. How many functions are from Z to Z ?

- 2_n
- $n \times n$
- n_n
- None of the other

Question: Compute the summation

$$\sum_{i=0}^2 (i^2 + 2)$$

- 5
- 3
- 0
- None of these.

Question: Let $S = \{n \in \mathbb{Z} / n = (-1)^k, \text{ for some integer } k\}$

- $S = \{1\}$
- $S = \{-1\}$
- $S = \{-1, 1\}$
- None of the other

Question: If $p=T, q=T, r=F$

Then

$$((\neg p) \wedge r) \rightarrow (q \wedge r)$$

Must be

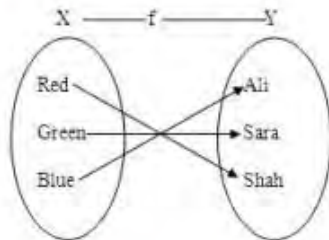
- F
- T
- $q \vee r$
- None of these.

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Question: Consider the relation $R = \{(1,1), (1,2), (1,4), (2,1), (2,2), (3,3), (4,4)\}$ on $A = \{1, 2, 3, 4\}$ is

- ▶ Symmetric
- ▶ Transitive
- ▶ Reflexive
- ▶ All of these

Question: The function defined by the following diagram is $f: X \rightarrow Y$



- ▶ One-to-one
- ▶ Onto
- ▶ Both one-to-one and onto
- ▶ None of these

Question: $1, 10, 10^2, 10^3, 10^4, 10^5, 10^6, 10^7, \dots$ is

- ▶ Arithmetic series (Pg 145)
- ▶ Geometric series
- ▶ Arithmetic sequence
- ▶ Geometric sequence

Question:

Negations for the given statement "The train is late or my watch is fast" is

- ▶ The train is not late or my watch is not fast.
- ▶ The train is not late and my watch is not fast.
- ▶ The train is not late or my watch is fast
- ▶ None of these.

Question:

Let R be the relation from $A = \{a_1, a_2, a_3\}$ (Elements of A are ordered by their subscript) to itself given by the matrix representation. Then R is

$$\begin{pmatrix} 0 & 1 & 0 \\ 1 & 0 & 1 \\ 0 & 1 & 0 \end{pmatrix}$$

- ▶ Reflexive and Symmetric.
- ▶ Symmetric and Transitive.
- ▶ Irreflexive and Symmetric.
- ▶ Irreflexive and Anti-Symmetric.

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Question: (Marks: 3)

Suppose $A = \{1\}$ and $B = \{u, v\}$. Find the power set of $A \times B$. That is, find $P(A \times B)$.

Question: (Marks: 5)

The fifth term of an arithmetic sequence is 17 and ninth term is 37 find the first four terms of this sequence.

Question: (Marks: 10)

For the real valued functions are defined below Find $\text{gof}(x)$ and

$f(x) = 3x^4 - 2x^2$
 $\text{gog}(x)$? where

$$g(x) = \frac{2}{\sqrt{x}}$$

&

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MTH202 - Discrete Mathematics

Question No: 1 (Marks: 1) - Please choose one

If p = Saima is hard working ,

q = Saima is good in mathematics

"Saima is hard working and good in mathematics" is denoted by

- ▶ $p \wedge q$
- ▶ $\sim (p \vee q)$
- ▶ $p \vee q$
- ▶ $p \wedge \sim q$

Question No: 2 (Marks: 1) - Please choose one

An argument is _____ if the conclusion is false when all the premises are true.

- ▶ Valid
- ▶ Invalid
- ▶ False
- ▶ None of these

Question No: 3 (Marks: 1) - Please choose one

Let $A = \mathbb{Z}_i$ the set of integers and let $R = \{(a, b) \in A \times A \mid a < b\}$ so that R is the relation "less than". Is R symmetric or antisymmetric?

- ▶ Symmetric
- ▶ Antisymmetric

Question No: 4 (Marks: 1) - Please choose one

Let $A = \{1, 2, 3, 4\}$ and $R = \{(1, 1), (2, 2), (3, 3), (4, 4)\}$ then

- ▶ R is symmetric.
- ▶ R is anti symmetric.
- ▶ R is transitive.
- ▶ R is reflexive.
- ▶ All given options are true

Question No: 5 (Marks: 1) - Please choose one

If two relations are reflexive then their composition is

- ▶ Antisymmetric
- ▶ Reflexive
- ▶ Irreflexive
- ▶ Symmetric

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Question No: 6 (Marks: 1) - Please choose one

The statement $(p \wedge q) \rightarrow r \equiv p \rightarrow (q \rightarrow r)$ describes

- ▶ Commutative Law
- ▶ Implication Laws
- ▶ Exportation Law
- ▶ Equivalence

Question No: 7 (Marks: 1) - Please choose one

How many functions are there from a set with three elements to a set with two elements?

- ▶ 6
- ▶ 8
- ▶ 12

Question No: 8 (Marks: 1) - Please choose one

If f and g are two one-to-one functions then their composition that is $g \circ f$ is

- ▶ Not one-to-one
- ▶ Onto
- ▶ One-to-one
- ▶ Onto and one-to-one

Question No: 9 (Marks: 1) - Please choose one

$$\sum_{k=b-c}^{d-c} (k+c) =$$

$$c \sum_{k=b-c}^{d-c} k$$

$$\sum_{k=b}^d k$$

$$\sum_{k=b}^d (k+i)$$

Question No: 10 (Marks: 1) - Please choose one

Let

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$$a_0 = 1, a_1 = -2 \text{ and } a_2 = 3$$

$$\text{then } \sum_{j=0}^2 a_j =$$

- ▶ -6
- ▶ 2
- ▶ 8

Question No: 11 (Marks: 1) - Please choose one

The part of definition which can be expressed in terms of smaller versions of itself is called

- ▶ Base
- ▶ Restriction
- ▶ Recursion
- ▶ Conclusion

Question No: 12 (Marks: 1) - Please choose one

Which of the given statement is incorrect?

- ▶ The process of defining an object in terms of smaller versions of itself is called recursion.
- ▶ A recursive definition has two parts: Base and Recursion.
- ▶ Functions cannot be defined recursively
- ▶ Sets can be defined recursively.

Question No: 13 (Marks: 1) - Please choose one

If A and B are two sets then The set of all elements that belong to A but not B , is

- ▶ $A \cup B$
- ▶ $A \cap B$
- ▶ None of these
- ▶ $A - B$

Question No: 14 (Marks: 1) - Please choose one

Associative law of union for three sets is

- ▶ $A \cup (B \cup C) = (A \cup B) \cup C$
- ▶ $A \cap (B \cap C) = (A \cap B) \cap C$
- ▶ $A \cup (B \cap C) = (A \cup B) \cap (A \cup C)$
- ▶ None of these

Question No: 15 (Marks: 1) - Please choose one

The statement of the form $p \wedge \sim p$ is:

- ▶ Tautology

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- ▶ Contradiction
- ▶ Fallacy

Question No: 16 (Marks: 1) - Please choose one

What is the output state of an OR gate if the inputs are 0 and 1?

- ▶ 0
- ▶ 1
- ▶ 2
- ▶ 3

Question No: 17 (Marks: 1) - Please choose one

Let A,B,C be the subsets of a universal set U.

$$(A \cup B) \cup C$$

Then is equal to:

- ▶ $A \cap (B \cup C)$
- ▶ $A \cup (B \cap C)$
- ▶ $\emptyset$
- ▶ $A \cup (B \cup C)$

Question No: 18 (Marks: 1) - Please choose one

Identify the false statement

- ▶ Two sets are disjoint if their intersection is empty set
- ▶ $A \cup A^c = U$
- ▶ $0 \in \emptyset$
- ▶ $\{\emptyset\} \subseteq \{\emptyset\}$
- ▶ If A and B are two sets $A \subseteq B$ and $B \subseteq A$ then $A = B$

Question No: 19 (Marks: 1) - Please choose one

If $A = \{\{5\}\}$, then power set of A is equal to

- ▶ $\{\{\emptyset, \{5\}\}\}$
- ▶ $\{\emptyset, \{5\}\}$
- ▶ $\{\emptyset, \{\{5\}\}\}$
- ▶ $\{\{\emptyset\}, \{5\}\}$

Question No: 20 (Marks: 1) - Please choose one

$$p \wedge q$$

Shows

- ▶ Conjunction of p and q
- ▶ Disjunction of p and q
- ▶ Contingency of p and q

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Question No: 21 (Marks: 2)

Suppose A is a set with m elements and B is a set with n elements.
How many functions are there from A to B?

Question No: 22 (Marks: 2)

Let the real valued functions f and g be defined by
 $f(x) = 2x + 1$ and $g(x) = x^2 - 1$
obtain the expression for $gf(x)$

Question No: 23 (Marks: 3)

Determine whether f is a function if

$$f(n) = \frac{1}{n^2 - 4}$$

Question No: 24 (Marks: 3)

Find the 5th term of the G.P. 3,6,12,...

Question No: 25 (Marks: 5)

Let $f : \mathbb{R} \rightarrow \mathbb{R}$ be defined by

$$f(x) = \frac{2x+1}{2x+2}$$

Is f onto?

Question No: 26 (Marks: 5)

Let $f(x) = 2x^2 - 1$ and $g(x) = 2x + a$ then find $3f(x) - g(x) + a$

MTH202- Discrete Mathematics MIDTERM EXAMINATION

Time: 60 min

Marks: 40

Question No: 1 (Marks: 1) - Please choose one

The negation of "Today is Friday" is

- Today is Saturday
- Today is not Friday **p_3**
- Today is Thursday

Question No: 2 (Marks: 1) - Please choose one

An arrangement of rows and columns that specifies the truth value of a compound proposition for all possible truth values of its constituent propositions is called

- Truth Table **p_4**
- Venn diagram
- False Table
- None of these

Question No: 3 (Marks: 1) - Please choose one

For two sets A,B

$A \cap (B \cup C) = (A \cap B) \cup (A \cap C)$ is called

- Distributivity of intersection over union
- Distributivity of union over intersection
- Distributivity Law **p_44**
- None of these

Question No: 4 (Marks: 1) - Please choose one

An argument is _____ if the conclusion is true when all the premises are true.

- Valid **p_19**
- Invalid
- False
- None of these

Question No: 5 (Marks: 1) - Please choose one

The row in the truth table of an argument where all premises are true is called

- Valid row
- Invalid row
- Critical row **p_19**
- None of these

Question No: 6 (Marks: 1) - Please choose one

Check whether

$$36 \equiv 1 \pmod{5}$$

$$33 \equiv 3 \pmod{10}$$

$$36 \text{ Modulus } 5 = 1 \text{ remainder}$$

$$33 \text{ Modulus } 10 = 3 \text{ remainder}$$

- Both are equivalent
- Second one is equivalent but first one is not
- First one is equivalent but second one is not

Question No: 7 (Marks: 1) - Please choose one

A binary relation R is called Partial order relation if

- It is Reflexive and transitive
- It is symmetric and transitive
- It is reflexive, symmetric and transitive
- It is reflexive, antisymmetric and transitive

p_79

Question No: 8 (Marks: 1) - Please choose one

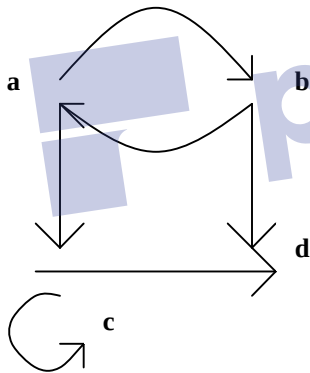
The order pairs which are not present in a relation, must be present in

- Inverse of that relation
- Composition of relations
- Complementary relation of that relation

p_84

Question No: 9 (Marks: 1) - Please choose one

The relation as a set of ordered pairs as shown in figure is



- $\{(a,b),(b,a),(b,d),(c,d)\}$
- $\{(a,b),(b,a),(a,c),(b,a),(c,c),(c,d)\}$
- $\{(a,b), (a,c), (b,a),(b,d), (c,c),(c,d)\}$
- $\{(a,b), (a,c), (b,a),(b,d),(c,d)\}$

p_63

Question No: 10 (Marks: 1) - Please choose one

A circuit with two input signals and one output signal is called

- NOT-gate (or inverter)
- AND- gate
- None of these

p_22

Question No: 11 (Marks: 1) - Please choose one

If $f(x)=2x+1$ then its inverse =

- $x-1$
- $\frac{1}{2}(x-1)$ **not sure** **p_112**
- $x^2 + 2$

Question No: 12 (Marks: 1) - Please choose one

Null set is denoted by

- (ϕ) or $\{ \}$. **P_30**
- A
- None of these

Question No: 13 (Marks: 1) - Please choose one

The total number of elements in a set is called

- Strength
- Cardinality
- Finite **p_31**

Question No: 14 (Marks: 1) - Please choose one

If $f(x)= x+1$ and $g(x)= -2x^2 + 1$ then $(2f - 1g)x=$

- $2x^2 - x$
- $3x+2$
- $2x^2 + 2x + 1$

$$2(x+1)-1(-2x^2+1)$$

$$2x+2+2x^2-1$$

$$2x^2+2x+1$$

Question No: 15 (Marks: 1) - Please choose one

Let

$$a_0 = 1, a_1 = -2 \text{ and } a_2 = 3$$

$$\text{Then } \sum_{j=0}^2 a_j =$$

- -6
- **2**
- 8

Question No: 16 (Marks: 1) - Please choose one

Which of the given statement is incorrect?

- The process of defining an object in terms of smaller versions of itself is called recursion.
- A recursive definition has two parts: Base and Recursion.
- Functions cannot be defined recursively
- Sets can be defined recursively.

Question No: 17 (Marks: 1) - Please choose one

The operations of intersection and union on sets are commutative

- ☒ True p_44
- ☐ False
- ☐ Depends on the sets given

Question No: 18 (Marks: 1) - Please choose one

The power set of a set A is the set of all subsets of A, denoted $P(A)$.

- ☐ False
- ☒ True p_58

Question No: 19 (Marks: 1) - Please choose one

What is the output state of an OR gate if the inputs are 0 and 1?

- ☐ 0
- ☒ 1 p_22
- ☐ 2
- ☐ 3

Question No: 20 (Marks: 1) - Please choose one

The product of the positive integers from 1 to n is called

- ☒ Multiplication
- ☐ n factorial
- ☐ Geometric sequence

Question No: 21 (Marks: 2)

Let

R be the relation on from A to B as

$R = \{(1, y), (2, x), (2, y), (3, x)\}$

Find

- (a) domain of R
- (b) range of R

Question No: 22 (Marks: 2)

Missing

Question No: 23 (Marks: 3)

Suppose that R and S are reflexive relations on a set A. Prove or disprove $R \cap S$ is reflexive.

Question No: 24 (Marks: 3)

Find the sum of the infinite G.P.

$$2, \sqrt{2}, 1, \dots$$

Question No: 25 (Marks: 5)

$$f(x) = \frac{x}{2} + 3 \text{ and } g(x) = \frac{3}{4}x - 2$$

then find the value of

$$5f(-2) - 7g(-4)$$

Question No: 26 (Marks: 5)

Write the geometric sequence with positive terms whose second term is 9 and fourth term is 1.



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MTH202 - Discrete Mathematics

Question: If $R = \{(a, a), (b, b), (c, c)\}$ is a relation on the set $A = \{a, b, c\}$ Then R is

- Symmetric only.
- Symmetric and reflexive only.
- Reflexive only.
- **Equivalence relation. (Pg 85)**

Question: The negation of the implication "If P is a square then P is a rectangle" is

- **If P is not a square then P is not a rectangle**
- P is not a square and P is a rectangle
- P is a square and P is not a rectangle.
- None of the above

Question: Identify the false statement

- **$0 \in \emptyset$**
- $\{\emptyset\} \subseteq \{\emptyset\}$
- If A and B are two sets $A \cap B$ and $B \cap A$ then $A \cap B = B \cap A$
- Two sets are disjoint if their intersection is empty set.
- $A \cap A^c = \emptyset$

Question: Let A be a set containing 3 elements then the total number of relations from A to A is

- 2^9
- 2^3
- **3^3**
- $2n$

Question: Let $A = \{1, 2, 3\}$ and $B = \{2, 3, 4, 5\}$ then

- $A \subseteq B$.
- A is a subset of B .
- A is improper subset of B .
- **Both 2 and 3.**

Question: Which of the following is not a Proposition?

- **$x > 11$.**
- Sun rounds about the Earth
- $11 + 7 = 18$
- None of above.

Question: $F = \{x \in \mathbb{R} \mid x^3 + 29x^2 - 3 = 0\}$

- **finite**
- infinite
- (c) none of above

Question: Let A has the same cardinality as B if and only if ,there is a----- correspondence between sets A and B

- one-one
- onto
- **(c) Both (a) and (b) (Pg 141)**

Question: Let $A = \{0, 1, 2, 3, 4, 5\}$ and we define functions $f: A \rightarrow A$ and then $g: A \rightarrow A$

$f(3)=3, f(4)=2, f(5)=2, f(2)=5, f(1)=2$

$g(1)=4, g(3)=3, g(5)=3, g(2)=1$

then $f \circ g(5)$ and $g \circ f(2)$

- **(a) $f \circ g(5) = g \circ f(2)$**
- (b) $f \circ g(5) \neq g \circ f(2)$
- (c) $f \circ g(3) = g \circ f(1)$
- (d) None of the above

MID TERM

Question: If $1=1$ then $2=2$, the conditional statement is

- True
- False
- None of other.

If $1^3 + 2^3 + 3^3 + \dots + n^3 =$

Then,

$$\left[\frac{n(n+1)}{2} \right]^2 \quad (\text{Pg 157})$$

$$\frac{n(n+1)(2n+1)}{6}$$

$$\frac{n(n+1)}{2}$$

None of these

Question: A set Z has n elements. How many functions are from Z to Z ?

- 2_n
- $n \times n$
- n_n
- None of the other

Question: Compute the summation

$$\sum_{i=0}^2 (i^2 + 2)$$

- 5
- 3
- 0
- None of these.

Question: Let $S = \{n \in \mathbb{Z} / n = (-1)^k, \text{ for some integer } k\}$

- $S = \{1\}$
- $S = \{-1\}$
- $S = \{-1, 1\}$
- None of the other

Question: If $p=T, q=T, r=F$

Then

$$((\neg p) \wedge r) \rightarrow (q \wedge r)$$

Must be

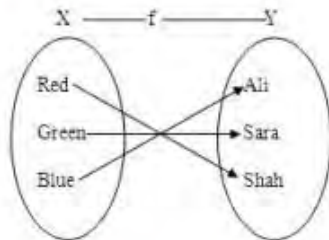
- F
- T
- $q \vee r$
- None of these.

MID TERM

Question: Consider the relation $R = \{(1,1), (1,2), (1,4), (2,1), (2,2), (3,3), (4,4)\}$ on $A = \{1, 2, 3, 4\}$ is

- ▶ Symmetric
- ▶ Transitive
- ▶ Reflexive
- ▶ All of these

Question: The function defined by the following diagram is $f: X \rightarrow Y$



- ▶ One-to-one
- ▶ Onto
- ▶ Both one-to-one and onto
- ▶ None of these

Question: $1, 10, 10^2, 10^3, 10^4, 10^5, 10^6, 10^7, \dots$ is

- ▶ Arithmetic series (Pg 145)
- ▶ Geometric series
- ▶ Arithmetic sequence
- ▶ Geometric sequence

Question:

Negations for the given statement "The train is late or my watch is fast" is

- ▶ The train is not late or my watch is not fast.
- ▶ The train is not late and my watch is not fast.
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$$\begin{pmatrix} 0 & 1 & 0 \\ 1 & 0 & 1 \\ 0 & 1 & 0 \end{pmatrix}$$

- ▶ Reflexive and Symmetric.
- ▶ Symmetric and Transitive.
- ▶ Irreflexive and Symmetric.
- ▶ Irreflexive and Anti-Symmetric.

MID TERM

Question: (Marks: 3)

Suppose $A = \{1\}$ and $B = \{u, v\}$. Find the power set of $A \times B$. That is, find $P(A \times B)$.

Question: (Marks: 5)

The fifth term of an arithmetic sequence is 17 and ninth term is 37 find the first four terms of this sequence.

Question: (Marks: 10)

For the real valued functions are defined below Find $\text{gof}(x)$ and

$f(x) = 3x^4 - 2x^2$
 $\text{gog}(x)$? where

$$g(x) = \frac{2}{\sqrt{x}}$$

&

MID TERM

MTH202 - Discrete Mathematics

Question: If $R = \{(a, a), (b, b), (c, c)\}$ is a relation on the set $A = \{a, b, c\}$ Then R is

- Symmetric only.
- Symmetric and reflexive only.
- Reflexive only.
- **Equivalence relation. (Pg 85)**

Question: The negation of the implication "If P is a square then P is a rectangle" is

- **If P is not a square then P is not a rectangle**
- P is not a square and P is a rectangle
- P is a square and P is not a rectangle.
- None of the above

Question: Identify the false statement

- **$0 \in \emptyset$**
- $\{\emptyset\} \subseteq \{\emptyset\}$
- If A and B are two sets $A \cap B$ and $B \cap A$ then $A \cap B = B \cap A$
- Two sets are disjoint if their intersection is empty set.
- $A \cap A^c = \emptyset$

Question: Let A be a set containing 3 elements then the total number of relations from A to A is

- 2^9
- 2^3
- **3^3**
- $2n$

Question: Let $A = \{1, 2, 3\}$ and $B = \{2, 3, 4, 5\}$ then

- $A \subseteq B$.
- A is a subset of B .
- A is improper subset of B .
- **Both 2 and 3.**

Question: Which of the following is not a Proposition?

- **$x > 11$.**
- Sun rounds about the Earth
- $11 + 7 = 18$
- None of above.

Question: $F = \{x \in \mathbb{R} \mid x^3 + 29x^2 - 3 = 0\}$

- **finite**
- infinite
- (c) none of above

Question: Let A has the same cardinality as B if and only if ,there is a----- correspondence between sets A and B

- one-one
- onto
- **(c) Both (a) and (b) (Pg 141)**

Question: Let $A = \{0, 1, 2, 3, 4, 5\}$ and we define functions $f: A \rightarrow A$ and then $g: A \rightarrow A$

$f(3)=3, f(4)=2, f(5)=2, f(2)=5, f(1)=2$

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$$\sum_{i=0}^2 (i^2 + 2)$$

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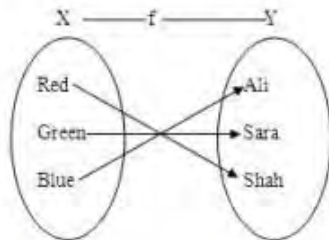
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- T
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MID TERM

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Negations for the given statement "The train is late or my watch is fast" is

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- ▶ Irreflexive and Anti-Symmetric.

MID TERM

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&

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MTH202 Discrete Mathematics

Question No. 1:

If p = It is raining q = She will go to college

"It is raining and she will not go to college" will be denoted by

- ☒ $p \wedge \sim q$
- ☐ $p \wedge q$
- ☐ $\sim (p \wedge q)$
- ☐ $\sim p \wedge q$

Question No. 2:

The negation of "Today is Friday" is

- ☐ Today is Saturday
- ☒ **Today is not Friday**
- ☐ Today is Thursday
- ☐ None of given

Question No. 3:

The converse of the conditional statement $p \rightarrow q$ is

- ☒ $q \rightarrow p$
- ☐ $\sim q \rightarrow \sim p$
- ☐ $\sim p \rightarrow \sim q$
- ☐ None of these

Question No. 4:

Contra-positive of given statement "If it is raining, I will take an umbrella" is

- ☒ **I will not take an umbrella if it is not raining. (Pg 19)**
- ☐ I will take an umbrella if it is raining.
- ☐ It is not raining or I will take an umbrella.
- ☐ None of these.

Question No. 5:

A statement is also referred to as a

- ☒ **Proposition (pg 4)**
- ☐ Conclusion
- ☐ Order
- ☐ None of these

Question No. 6:

The statement "It is not raining if and only if roads are dry" is logically equivalent to

- ☐ If roads are dry then it is not raining.
- ☒ **Roads are dry if and only if it is not raining**
- ☐ None of these.
- ☐ If it is not raining then roads are dry.

Question No. 7:

The statement $\sim(\sim p) = p$ Describes

- ☐ Commutative Law
- ☐ Implication Laws
- ☒ **Double negative law**
- ☐ Equivalence

Question No. 8:

An arrangement of rows and columns that specifies the truth value of a compound proposition for all possible truth values of its constituent propositions is called

- ☒ **Truth Table**
- ☐ Venn diagram
- ☐ False Table
- ☐ None of these

Question No. 9:

An argument is _____ if the conclusion is true when all the premises are true.

- ☒ **Valid (Pg 25)**
- ☐ Invalid
- ☐ False
- ☐ None of these

Question No. 10:

The row in the truth table of an argument where all premises are true is called

- ☐ Valid row
- ☐ Invalid row
- ☒ **Critical row (Pg 27)**
- ☐ None of these

Question No. 11:

The statement $p \rightarrow q \equiv (p \wedge \sim q) \rightarrow c$ describes

- ☐ Commutative Law ☐ Implication Laws ☐ Exportation Law ☒ **Reductio ad absurdum**

Question No. 12:

$p \leftrightarrow q$ is logically equivalent to $(p \rightarrow q) \wedge (q \rightarrow p)$ ☐ TRUE ☐ FALSE

Question No. 13:

According to biconditional $1+1=3$ if and only if sky is yellow. ☒ **TRUE (Pg 20)** ☐ FALSE

Question No. 14:

A statement that is always true regardless of the truth values of the statement variables called Tautology.

- ☒ **TRUE (Pg 10)** ☐ FALSE

Question No. 15:

If p and q are statement variables, then the conjunction of p and q is "p and q" denoted as " $p \vee q$ ".

- ☐ TRUE ☒ **FALSE**

Question No: 3 (Marks: 1) - Please choose one

For two sets A,B

$A \cap (B \cup C) = (A \cap B) \cup (A \cap C)$ is called

- ▶ Distributivity of intersection over union
- ▶ Distributivity of union over intersection
- ▶ None of these
- ▶ **Distributivity Law**

Question No: 6 (Marks: 1) - Please choose one

Check whether

$36 \equiv 1 \pmod{5}$ $36 \text{ Modulus } 5 = 1 \text{ remainder}$

$33 \equiv 3 \pmod{10}$ $33 \text{ Modulus } 10 = 3 \text{ remainder}$

- ▶ **Both are equivalent**
- ▶ Second one is equivalent but first one is not
- ▶ First one is equivalent but second one is not

Question No: 7 (Marks: 1) - Please choose one

A binary relation R is called Partial order relation if

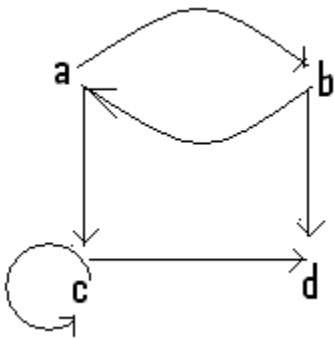
- ▶ It is Reflexive and transitive
- ▶ It is symmetric and transitive
- ▶ It is reflexive, symmetric and transitive
- ▶ **It is reflexive, anti-symmetric and transitive (Pg 92)**

Question No: 8 (Marks: 1) - Please choose one

The order pairs which are not present in a relation, must be present in

- ▶ Inverse of that relation
- ▶ Composition of relations
- ▶ **Complementary relation of that relation (pg 97)**

Question No: 9 (Marks: 1) - Please choose one
The relation as a set of ordered pairs as shown in figure is



- ▶ $\{(a,b),(b,a),(b,d),(c,d)\}$
- ▶ $\{(a,b),(b,a),(a,c),(b,a),(c,c),(c,d)\}$
- ▶ **$\{(a,b), (a,c), (b,a),(b,d), (c,c),(c,d)\}$**
- ▶ $\{(a,b), (a,c), (b,a),(b,d),(c,d)\}$

Question No: 10 (Marks: 1) - Please choose one
A circuit with two input signals and one output signal is called

- ▶ NOT-gate (or inverter)
- ▶ **AND- gate**
- ▶ None of these

Question No: 11 (Marks: 1) - Please choose one
If $f(x)=2x+1$ then its inverse =

- ▶ $x-1$
- ▶ **$\frac{1}{2}(x-1)$**
- ▶ $x^2 +2$

$f(x)=2x+1$

$y=2x+1$

$x=\frac{y-1}{2}$

$f(x)^{-1}=\frac{y-1}{2}$

Question No: 12 (Marks: 1) - Please choose one
Null set is denoted by

- ▶ **(phi) or { }. (pg 39)**
- ▶ A
- ▶ None of these

Question No: 13 (Marks: 1) - Please choose one
The total number of elements in a set is called

- ▶ Strength
- ▶ **Cardinality (pg 141)**
- ▶ Finite

Question No: 14 (Marks: 1) - Please choose one

If $f(x) = x+1$ and $g(x) = -2x^2 + 1$ then $(2f - 1g)x =$

- ▶ $2x^2 - x$
- ▶ $3x+2$
- ▶ $2x^2 + 2x + 1$

$$= (2f - 1g)x$$

$$= 2f(x) - g(x)$$

$$= 2.(x+1) - (-2x^2 + 1)$$

$$= 2x + 2 + 2x^2 - 1$$

$$= 2x^2 + 2x + 1$$

Question No: 15 (Marks: 1) - Please choose one

Let

$$a_0 = 1, a_1 = -2 \text{ and } a_2 = 3$$

$$\text{then } \sum_{j=0}^2 a_j =$$

- ▶ -6
- ▶ 2
- ▶ 8

Question No: 16 (Marks: 1) - Please choose one

Which of the given statement is incorrect?

- ▶ The process of defining an object in terms of smaller versions of itself is called recursion. (Pg 159)
- ▶ A recursive definition has two parts: Base and Recursion.
- ▶ **Functions cannot be defined recursively (Pg 159)**
- ▶ Sets can be defined recursively. (Pg 165)

Question No: 17 (Marks: 1) - Please choose one

The operations of intersection and union on sets are commutative

▶ **True (Pg 42)**

▶ False

▶ Depends on the sets given

Question No: 18 (Marks: 1) - Please choose one

The power set of a set A is the set of all subsets of A, denoted $P(A)$.

- ▶ False
- ▶ **True (Pg 68)**

Question No: 19 (Marks: 1) - Please choose one

What is the output state of an OR gate if the inputs are 0 and 1?

- ▶ 0
- ▶ 1
- ▶ 2
- ▶ 3

Question No: 20 (Marks: 1) - Please choose one

The product of the positive integers from 1 to n is called

- ▶ Multiplication
- ▶ **n factorial**
- ▶ Geometric sequence

Question No: 6 (Marks: 1) - Please choose one

Let $A = \{1, 2, 3, 4\}$ and $R = \{(1, 1), (2, 2), (3, 3), (4, 4)\}$ then

- ▶ R is symmetric.
- ▶ R is anti symmetric.
- ▶ R is transitive.
- ▶ R is reflexive.
- ▶ **All given options are true**

Question No: 7 (Marks: 1) - Please choose one

The inverse of given relation

$R = \{(1,1),(1,2),(1,4),(3,4),(4,1)\}$ is

- ▶ $\{(1,1),(2,1),(4,1),(2,3)\}$
- ▶ $\{(1,1),(1,2),(4,1),(4,3),(1,4)\}$
- ▶ **$\{(1,1),(2,1),(4,1),(4,3),(1,4)\}$ (Pg 95)**

Question No: 11 (Marks: 1) - Please choose one

$$(A \cap B)^c = (A^c \cap B^c)$$

- ▶ True
- ▶ **False**

Question No: 13 (Marks: 1) - Please choose one

Let g be the functions defined by
 $g(x) = 3x + 2$ then $g \circ g(x) =$

- ▶ $9x^2 + 4$
- ▶ $6x + 4$
- ▶ **$9x + 8$**

<http://www.vustudents.net>

$$\begin{aligned} g(g(x)) &= g(3x + 2) \\ &= 3(3x + 2) + 2 \\ &= 9x + 6 + 2 \\ &= 9x + 8 \end{aligned}$$

Question No: 16 (Marks: 1) - Please choose one

The Common fraction for the recurring decimal 0.81 is

- ▶ $\frac{81}{100}$
- ▶ $\frac{81}{98}$
- ▶ **$\frac{9}{11}$**

(Pg 157)

Question No: 17 (Marks: 1) - Please choose one

A collection of rules indicating how to form new set objects from those already known to be in the set is called

- ▶ Base
- ▶ Restriction
- ▶ **Recursion (Pg159)**

Question No: 19 (Marks: 1) - Please choose one

The statement of the form $p \vee \sim p$ is:

- ▶ **Tautology (Pg 10)**
- ▶ Contradiction
- ▶ Fallacy

Question No: 20 (Marks: 1) - Please choose one

Let A,B,C be the subsets of a universal set U.

Then $(A \cup B) \cup C$ is equal to:

- ▶ $A \cap (B \cup C)$

$$A \cup (B \cap C)$$



$$\emptyset$$



$$A \cup (B \cup C)$$

Associative Law

Question: If $R = \{(a, a), (b, b), (c, c)\}$ is a relation on the set $A = \{a, b, c\}$ Then R is

- Symmetric only.
- Symmetric and reflexive only.
- Reflexive only.
- **Equivalence relation. (Pg 85)**

Question: The negation of the implication “If P is a square then P is a rectangle” is

- **If P is not a square then P is not a rectangle**
- P is not a square and P is a rectangle
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- **$0 \in \emptyset$**
- $\{\emptyset\} \subseteq \emptyset$
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- 2^3
- **3^3**
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- **$x > 11$.**
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- onto
- **(c) Both (a) and (b) (Pg 141)**

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- (b) $f \circ g(5) \neq g \circ f(2)$
- (c) $f \circ g(3) = g \circ f(1)$
- (d) None of the above

$$f \circ g(5) = fg(5)$$

$$= f(3) = 3$$

$$g \circ f(2) = gf(2)$$

$$= g(5) = 3$$

Question: Choose the correct answer:

If f and g are two one-to-one functions, then their composition of gof is

- onto
- **one-to-one (Pg 134)**
- (c) bijective

Question: If $1=1$ then $2=2$, the conditional statement is

- **True**
- False
- None of other.

$$\text{If } 1^3 + 2^3 + 3^3 + \dots + n^3 =$$

Then,

$$\left[\frac{n(n+1)}{2} \right]^2 \quad (\text{Pg 157})$$

$$\frac{n(n+1)(2n+1)}{6}$$

$$\frac{n(n+1)}{2}$$

None of these

Question: A set Z has n elements. How many functions are from Z to Z?

- 2_n
- **$n \times n$**
- n_n
- None of the other

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$$\sum_{i=0}^2 (i^2 + 2)$$

- 5
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- $S = \{1\}$
- $S = \{-1\}$
- $S = \{-1, 1\}$
- None of the other

Question: If $p=T, q=T, r=F$

Then

$$((\sim p) \wedge r) \rightarrow (q \wedge r)$$

Must be

- F
- **T**
- $q \vee r$
- None of these.

Question: If $A = \{a, b, c, d\}$ then the number of elements of power set $P(A)$ are

$$2^4$$

$$2^5$$

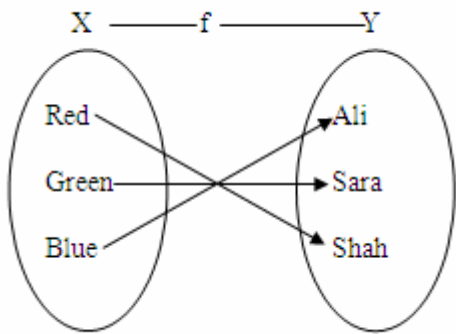
$$2^6$$

$$2^7$$

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- ▶ Symmetric
- ▶ Transitive
- ▶ **Reflexive**
- ▶ All of these

Question: The function defined by the following diagram is $f: X \rightarrow Y$



- ▶ One-to-one
- ▶ Onto
- ▶ **Both one-to-one and onto**
- ▶ None of these

Question: $1,10,10^2,10^3,10^4,10^5,10^6,10^7,.....$

is

- ▶ **Arithmetic series (Pg 145)**
- ▶ Geometric series
- ▶ Arithmetic sequence
- ▶ Geometric sequence

- ▶ **The train is not late or my watch is not fast.**
- ▶ The train is not late and my watch is not fast.
- ▶ The train is not late or my watch is fast
- ▶ None of these.

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Let R be the relation from $A=\{a_1,a_2,a_3\}$ (Elements of A are ordered by their subscript)to itself given by the matrix representation . Then R is

$$\begin{pmatrix} 0 & 1 & 0 \\ 1 & 0 & 1 \\ 0 & 1 & 0 \end{pmatrix}$$

- ▶ Reflexive and Symmetric.
- ▶ Symmetric and Transitive.
- ▶ **Irreflexive and Symmetric.**
- ▶ Irreflexive and Anti- Symmetric.

If out of 35 people each person like Discrete Mathematics or Data Structures ,25 like Discrete Mathematics, and 20 like Data structures then the number of people who like

both Discrete and Data Structures is.....

- ▶ 5
- ▶ 15
- ▶ 10
- ▶ None of these.

Question: Inverse of a function may not be a function

- True (Pg 124)
- False

Question No: 1 (Marks: 1) - Please choose one

The inverse of given relation $R = \{(1,1),(1,2),(1,4),(3,4),(4,1)\}$ is

- ▶ $\{(1,1),(2,1),(4,1),(2,3)\}$
- ▶ $\{(1,1),(1,2),(4,1),(4,3),(1,4)\}$
- ▶ $\{(1,1),(2,1),(4,1),(4,3),(1,4)\}$

Question No: 2 (Marks: 1) - Please choose one
Symmetric and antisymmetric are

- ▶ Negative of each other
- ▶ Both are same
- ▶ Not negative of each other (Pg 90)

Question No: 3 (Marks: 1) - Please choose one
Let $A = \{a, b, c\}$ and

$R = \{(a, c), (b, b), (c, a)\}$ be a relation on A. Is R

- ▶ Transitive
- ▶ Reflexive
- ▶ Symmetric
- ▶ Transitive and Reflexive

Question: In Boolean addition $1+1=$

- ▶ 2
- ▶ 1 (Pg 99)
- ▶ 0

Question No: 8 (Marks: 1) - Please choose one
The same element can never appear twice in a set

- ▶ True
- ▶ False

Question No: 9 (Marks: 1) - Please choose one

If $f(x)=2x+1$, $g(x)=x^2-1$ then $fg(x)=$

- ▶ x^2-1
- ▶ $2x^2-1$
- ▶ $2x^3-1$

$$fg(x) = f(x^2 - 1)$$

$$f(x^2 - 1) = 2(x^2 - 1) + 1$$

$$= 2x^2 - 2 + 1$$

$$= 2x^2 - 1$$

Question No: 13 (Marks: 1) - Please choose one

If a set contains exactly m distinct elements where m denotes some non negative integer then the set is .

► **Finite**

► Infinite

► None of these

Question No: 14 (Marks: 1) - Please choose one

If $f(4) = 1$ and $g(1) = 4$ then $fog(1) =$

► 3

► **1**

► 4

$$fog(1) = fg(1)$$

$$= f(4) = 1$$

Question No: 15 (Marks: 1) - Please choose one

If $(A \cup B) = A$, then $(A \cap B) = B$

► **True**

► False

► Cannot be determined

Question No: 16 (Marks: 1) - Please choose one

The total number of elements in a set is called

► Strength

► **Cardinality**

► Finite

Question No: 17 (Marks: 1) - Please choose one

If $f(x) = x$ and $g(x) = -2x$ then $(f+g)x =$

► $3x$

► $2x^2$

► **$-x$**

Question No: 19 (Marks: 1) - Please choose one

Which term of the sequence $4, 1, -2, \dots$ is -77

► **26**

► 27

► 28

Question No: 20 (Marks: 1) - Please choose one

If a set A has 5 elements then power set of A , $P(S)$ contains elements. Which are?

► 5^5

► 2^n

► 4^5

► **2^5**

Question No: 13 (Marks: 1) - Please choose one

Let g be the functions defined by

$g(x) = 3x + 2$ then $g \circ g(x) =$

▶ $9x^2 + 4$

▶ $6x + 4$

▶ **$9x + 8$**

$g \circ g(x)$

$= 3(3x + 2) + 2$

$= 9x + 6 + 2$

$= 9x + 8$

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Best of luck!



Question No : 1 of 26

Marks: 1 (Budgeted Time 1 Min)

Rephrase the following statement in bi-conditional form
"If you get up early in the morning, you will be healthy"

Answer (Please select your correct option)

☐ You will be healthy if and only if you get up early in the morning

correct

☐ If you will be healthy then you will get up early in the morning

☐ If you will get up early in the morning then you will be healthy

☐ None of these

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Question No : 2 of 26

Marks: 1 (Budgeted Time 1 Min)

Reductio ad absurdum law is symbolically denoted as

Answer (Please select your correct option)

☐ $(p \wedge q) \rightarrow r \equiv p \rightarrow (q \rightarrow r)$

☐ $p \leftrightarrow q \equiv (p \rightarrow q) \wedge (q \rightarrow p)$

☐ $p \rightarrow q \equiv \sim p \vee q$

☐ $p \rightarrow q \equiv (p \wedge \sim q) \rightarrow c$

correct

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Question No : 3 of 26

Marks: 1 (Budgeted Time 1 Min)

A critical row is that in which _____ premises have truth value T.

Answer (Please select your correct option)

☐ at least one

☐ exactly one

☐ all

☐ at least two

correct

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Question No : 4 of 26

Marks: 1 (Budgeted Time 1 Min)

What will be the output of an OR-gate if it has inputs 0 and 1?

Answer (Please select your correct option)

☐ 0

☒ 1

☐ 2

☐ 3

correct

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Question No : 5 of 26

Marks: 1 (Budgeted Time 1 Min)

Let U be the universal set and A is its subset then $A \cup A^c$ is equal to

Answer (Please select your correct option)

☐ A

correct

☐ A^c

☐ $\emptyset$

☐ U

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Question No : 6 of 26

Marks: 1 (Budgeted Time 1 Min)

Identify the false statement

Answer (Please select your correct option)

☐ $0 \in \phi$ correct

☐ $\{\phi\} \subseteq \{\phi\}$

☐ If A and B are two sets $A \subseteq B$ and $B \subseteq A$ then $A = B$

☐ Two sets are disjoint if their intersection is empty set

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Question No : 7 of 26

Marks: 1 (Budgeted Time 1 Min)

If A and S are two reflexive relations then $A \cap S$ will be

Answer (Please select your correct option)

☐ Symmetric

☐ Reflexive

☐ Transitive

correct

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Question No : 8 of 26

Marks: 1 (Budgeted Time 1 Min)

Symmetric and Anti-symmetric relations are

Answer (Please select your correct option)

☐ negative of each other.

☐ same.

☐ not negative of each other.

correct

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Question No : 9 of 26

Marks: 1 (Budgeted Time 1 Min)

If two relations are reflexive then their composition is

Answer (Please select your correct option)

☐ Anti-symmetric

☐ Reflexive

correct

☐ Irreflexive

☐ Symmetric

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Question No : 10 of 26

Marks: 1 (Budgeted Time 1 Min)

Inverse of relation can be obtained by

Answer (Please select your correct option)

☐ changing signs of elements in order pairs.

☒ changing position of elements in order pairs.

☐ taking multiplicative inverse of elements in order pairs.



correct

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Question No : 11 of 26

Marks: 1 (Budgeted Time 1 Min)

Let $A \times A = \{(1,1), (1,2), (1,3), (2,1), (2,2), (2,3), (3,1), (3,2), (3,3)\}$, find which one of the given relations is a function.

Answer (Please select your correct option)

☐

$$R_1 = \{(1,3), (2,2), (3,1)\}$$

☐

$$R_2 = \{(1,1), (1,2), (2,1)\}$$

☐

$$R_3 = \{(2,2), (2,3), (3,1)\}$$

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Question No : 12 of 26

Marks: 1 (Budgeted Time 1 Min)

If $f(x) = 2x + 1$ and $g(x) = x^2 - 1$ then $f \circ f(x) =$

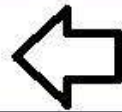
Answer (Please select your correct option)

☐ $4x - 3$

☐ $4x^2 + 1$

☒ $4x + 3$

☐ $4x^2 - 1$



correct

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Question No : 13 of 26

Marks: 1 (Budgeted Time 1 Min)

Let f and g be the functions defined by $f(x) = 2x + 3$ and $g(x) = 3x + 2$ then composition of f and g is

Answer (Please select your correct option)

☐ $6x + 6$

correct



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☐ $5x + 5$

☐ $6x + 7$

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Question No : 14 of 26

Marks: 1 (Budgeted Time 1 Min)

The negation of $1 < x < 10$ is $x \leq 1$ or $x \geq 10$ by using:

Answer (Please select your correct option)

- ☐ Distributive Law
- ☐ Inequality Law
- ☐ De-Morgan's Law
- ☐ None of these

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Question No : 15 of 26

Marks: 1 (Budgeted Time 1 Min)

If the n th term of a sequence is $a_n = 2(-3)^n + 5^n$ then the term a_1 is

Answer (Please select your correct option)

☐ -1

☐ 0

☐ 1

☐ 2

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Question No : 16 of 26

Marks: 1 (Budgeted Time 1 Min)

The part of definition which can be expressed in terms of smaller versions of itself is called

Answer (Please select your correct option)

☐ Recursion

correct



☐ Conclusion

☐ Base

☐ Restriction

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Question No : 17 of 26

Marks: 1 (Budgeted Time 1 Min)

The tower of Hanoi is a puzzle consisting of

Answer (Please select your correct option)

☐ 2 people

☐ 3 people

☐ 4 people

correct

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Question No : 18 of 26

Marks: 1 (Budgeted Time 1 Min)

The same element can never appear ----- in a set.

Answer (Please select your correct option)

☐ twice

correct

☐ once

☐ thrice

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Question No : 19 of 26

Marks: 1 (Budgeted Time 1 Min)

If $(A \cup B) = A$ then

Answer (Please select your correct option)

☐

$$(A \cap B) = B^c$$

☐

$$(A \cap B) = A$$

☐

$$(A \cap B) = B$$

correct

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If p = It is raining

q = She will go to college

"It is raining and she will not go to college" will be denoted by

Answer (Please select your correct option)

☐ $p \wedge \neg q$

correct

☐ $p \wedge q$

☐ $\neg (p \wedge q)$

☐ $\neg p \wedge q$

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Question No : 21 of 26

Marks: 2 (Budgeted Time 4 Min)

Determine whether the function $f(x) = x + 1$ is one-to-one?

Answer (Please [click here](#) to Add Answer)



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Question No : 22 of 26

Marks: 2 (Budgeted Time 4 Min)

Compute the first four terms of the sequence defined by the formula $a_n = 3n - 5$.

Answer (Please [click here to Add Answer](#))



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Question No : 23 of 26

Marks: 3 (Budgeted Time 6 Min)

Show that $f(x) = x^3 + 1$ is onto function.

Answer ([Please click here to Add Answer](#))



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Marks: 3 (Budgeted Time 6 Min)

Answer (Please [click here](#) to Add Answer)

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Question No : 25 of 26

Marks: 5 (Budgeted Time 10 Min)

Let $A = \{a, b, c, d\}$ be a set and consider the relation $R = \{(a, a), (a, b), (a, c), (a, d), (b, b), (b, d), (c, c), (c, d), (d, d)\}$ on A . Show that R is a partial ordering.

Answer ([Please click here to Add Answer](#))



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Question No : 26 of 26

Marks: 5 (Budgeted Time 10 Min)

Let $f(x) = ax + b$ and $g(x) = cx + d$, where a, b, c and d are constants. Under what condition $f \circ g(x) = g \circ f(x)$.

Answer (Please [click here](#) to Add Answer)

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Question No : 1 of 26

Marks: 1 (Budgeted Time 1 Min)

Rephrase the following statement in bi-conditional form
"If you get up early in the morning, you will be healthy"

Answer (Please select your correct option)

☐ You will be healthy if and only if you get up early in the morning

correct

☐ If you will be healthy then you will get up early in the morning

☐ If you will get up early in the morning then you will be healthy

☐ None of these

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Question No : 2 of 26

Marks: 1 (Budgeted Time 1 Min)

Reductio ad absurdum law is symbolically denoted as

Answer (Please select your correct option)

☐ $(p \wedge q) \rightarrow r \equiv p \rightarrow (q \rightarrow r)$

☐ $p \leftrightarrow q \equiv (p \rightarrow q) \wedge (q \rightarrow p)$

☐ $p \rightarrow q \equiv \sim p \vee q$

☐ $p \rightarrow q \equiv (p \wedge \sim q) \rightarrow c$

correct

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Question No : 3 of 26

Marks: 1 (Budgeted Time 1 Min)

A critical row is that in which _____ premises have truth value T.

Answer (Please select your correct option)

☐ at least one

☐ exactly one

☐ all

☐ at least two

correct

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Question No : 4 of 26

Marks: 1 (Budgeted Time 1 Min)

What will be the output of an OR-gate if it has inputs 0 and 1?

Answer (Please select your correct option)

☐ 0

☒ 1

correct

☐ 2

☐ 3

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Question No : 5 of 26

Marks: 1 (Budgeted Time 1 Min)

Let U be the universal set and A is its subset then $A \cup A^c$ is equal to

Answer (Please select your correct option)

☐ A

correct

☐ A^c

☐ $\emptyset$

☐ U

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Question No : 6 of 26

Marks: 1 (Budgeted Time 1 Min)

Identify the false statement

Answer (Please select your correct option)

☐ $0 \in \phi$

correct

☐ $\{\phi\} \subseteq \{\phi\}$

☐ If A and B are two sets $A \subseteq B$ and $B \subseteq A$ then $A = B$

☐ Two sets are disjoint if their intersection is empty set

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Question No : 7 of 26

Marks: 1 (Budgeted Time 1 Min)

If A and S are two reflexive relations then $A \cap S$ will be

Answer (Please select your correct option)

☐ Symmetric

☐ Reflexive

☐ Transitive

correct

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Question No : 8 of 26

Marks: 1 (Budgeted Time 1 Min)

Symmetric and Anti-symmetric relations are

Answer (Please select your correct option)

☐ negative of each other.

☐ same.

☐ not negative of each other.

correct

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Question No : 9 of 26

Marks: 1 (Budgeted Time 1 Min)

If two relations are reflexive then their composition is

Answer (Please select your correct option)

☐ Anti-symmetric

☐ Reflexive

correct

☐ Irreflexive

☐ Symmetric

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Question No : 10 of 26

Marks: 1 (Budgeted Time 1 Min)

Inverse of relation can be obtained by

Answer (Please select your correct option)

☐ changing signs of elements in order pairs.

☒ changing position of elements in order pairs.

☐ taking multiplicative inverse of elements in order pairs.



correct

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Question No : 11 of 26

Marks: 1 (Budgeted Time 1 Min)

Let $A \times A = \{(1,1), (1,2), (1,3), (2,1), (2,2), (2,3), (3,1), (3,2), (3,3)\}$, find which one of the given relations is a function.

Answer (Please select your correct option)

☐

$$R_1 = \{(1,3), (2,2), (3,1)\}$$

☐

$$R_2 = \{(1,1), (1,2), (2,1)\}$$

☐

$$R_3 = \{(2,2), (2,3), (3,1)\}$$

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Question No : 12 of 26

Marks: 1 (Budgeted Time 1 Min)

If $f(x) = 2x + 1$ and $g(x) = x^2 - 1$ then $f \circ f(x) =$

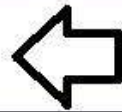
Answer (Please select your correct option)

☐ $4x - 3$

☐ $4x^2 + 1$

☒ $4x + 3$

☐ $4x^2 - 1$



correct

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Question No : 13 of 26

Marks: 1 (Budgeted Time 1 Min)

Let f and g be the functions defined by $f(x) = 2x + 3$ and $g(x) = 3x + 2$ then composition of f and g is

Answer (Please select your correct option)

☐ $6x + 6$

correct



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☐ $5x + 5$

☐ $6x + 7$

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Question No : 14 of 26

Marks: 1 (Budgeted Time 1 Min)

The negation of $1 < x < 10$ is $x \leq 1$ or $x \geq 10$ by using:

Answer (Please select your correct option)

- ☐ Distributive Law
- ☐ Inequality Law
- ☐ De-Morgan's Law
- ☐ None of these

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Question No : 15 of 26

Marks: 1 (Budgeted Time 1 Min)

If the n th term of a sequence is $a_n = 2(-3)^n + 5^n$ then the term a_1 is

Answer (Please select your correct option)

☐ -1

☐ 0

☐ 1

☐ 2

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Question No : 16 of 26

Marks: 1 (Budgeted Time 1 Min)

The part of definition which can be expressed in terms of smaller versions of itself is called

Answer (Please select your correct option)

☐ Recursion

correct



☐ Conclusion

☐ Base

☐ Restriction

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Question No : 17 of 26

Marks: 1 (Budgeted Time 1 Min)

The tower of Hanoi is a puzzle consisting of

Answer (Please select your correct option)

☐ 2 people

☐ 3 people

☐ 4 people

correct

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Question No : 18 of 26

Marks: 1 (Budgeted Time 1 Min)

The same element can never appear ----- in a set.

Answer (Please select your correct option)

☐ twice

correct

☐ once

☐ thrice

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Question No : 19 of 26

Marks: 1 (Budgeted Time 1 Min)

If $(A \cup B) = A$ then

Answer (Please select your correct option)

☐

$$(A \cap B) = B^c$$

☐

$$(A \cap B) = A$$

☐

$$(A \cap B) = B$$

correct

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If p = It is raining

q = She will go to college

"It is raining and she will not go to college" will be denoted by

Answer (Please select your correct option)

☐ $p \wedge \neg q$

correct

☐ $p \wedge q$

☐ $\neg (p \wedge q)$

☐ $\neg p \wedge q$

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Question No : 21 of 26

Marks: 2 (Budgeted Time 4 Min)

Determine whether the function $f(x) = x + 1$ is one-to-one?

Answer (Please [click here](#) to Add Answer)



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Question No : 22 of 26

Marks: 2 (Budgeted Time 4 Min)

Compute the first four terms of the sequence defined by the formula $a_n = 3n - 5$.

Answer (Please [click here to Add Answer](#))



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Question No : 23 of 26

Marks: 3 (Budgeted Time 6 Min)

Show that $f(x) = x^3 + 1$ is onto function.

Answer ([Please click here to Add Answer](#))



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Marks: 3 (Budgeted Time 6 Min)

Answer (Please [click here](#) to Add Answer)

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Question No : 25 of 26

Marks: 5 (Budgeted Time 10 Min)

Let $A = \{a, b, c, d\}$ be a set and consider the relation $R = \{(a, a), (a, b), (a, c), (a, d), (b, b), (b, d), (c, c), (c, d), (d, d)\}$ on A . Show that R is a partial ordering.

Answer ([Please click here to Add Answer](#))



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Question No : 26 of 26

Marks: 5 (Budgeted Time 10 Min)

Let $f(x) = ax + b$ and $g(x) = cx + d$, where a, b, c and d are constants. Under what condition $f \circ g(x) = g \circ f(x)$.

Answer (Please [click here](#) to Add Answer)

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Best of luck!



Question # 5 of 30 (Start time: 03:33:02 PM, 30 December 2020)

Total Marks: 1

A function whose range consists of only one element is called.....

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Select the correct option

☐	Constant function	//
☐	Onto function	//
☒	One to one function	//
☐	Identity function	

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Question # 2 of 30 (Start time: 03:31:23 PM, 30 December 2020)

Total Marks: 1

The _____ of the terms of a sequence forms a series.

Select the correct option

☐	Multiplication
☒	Sum

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Question # 10 of 30 (Start time: 03:36:58 PM, 30 December 2020)

Total Marks: 1

If a set A has 15 elements then $P(A)$ (power set of A) has _____ elements.

Select the correct option

☐	2^{13}	
☐	2^{14}	
☒	2^{15}	
☐	2^{16}	

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If $A \cap B = \phi$ then A and B are called.

Select the correct option

 Reload Math Equations

☒	disjont
☐	overlapping
☐	universal
☐	subsets

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Question # 30 of 30 (Start time: 03:52:46 PM, 30 December 2020)

Total Marks: 1

The inverse of the statement 'If it is pleasant outside, then I go to the park' is -----

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Select the correct option

☐

If it is NOT pleasant outside, then I go to the park.

☐

If it is pleasant outside, then I do NOT go to the park.

☐

If it is NOT pleasant outside, then I do NOT go to the park.

☒

If I go to the park, then it is pleasant outside.

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Question # 11 of 30 (Start time: 03:37:37 PM, 30 December 2020)

Total Marks: 1

 $x+2=3$ is a proposition?

Select the correct option

☒	True
☐	False

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Question # 19 of 30 (Start time: 03:45:03 PM, 30 December 2020)

Total Marks: 1

 $0! = 1!$

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Select the correct option

True

False

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Question # 22 of 30 (Start time: 03:46:29 PM, 30 December 2020)

Total Marks: 1

The set of integers "Z" is a subset of the set of _____.

Select the correct option

☒	Natural Numbers	✓
☐	Irrational Numbers	✗
☐	Prime Numbers	✗
☐	Rational Numbers	✗

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Question # 10 of 30 (Start time: 03:36:58 PM, 30 December 2020)

Total Marks: 1

If a set A has 15 elements then $P(A)$ (power set of A) has _____ elements.

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Select the correct option

☐	2^{13}	
☐	2^{14}	
☒	2^{15}	
☐	2^{16}	

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If $A \cap B = \phi$ then A and B are called.

Select the correct option

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☒	disjont
☐	overlapping
☐	universal
☐	subsets

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Question # 30 of 30 (Start time: 03:52:46 PM, 30 December 2020)

Total Marks: 1

The inverse of the statement 'If it is pleasant outside, then I go to the park' is -----

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Select the correct option

☐

If it is NOT pleasant outside, then I go to the park.

☐

If it is pleasant outside, then I do NOT go to the park.

☐

If it is NOT pleasant outside, then I do NOT go to the park.

☒

If I go to the park, then it is pleasant outside.

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Question # 11 of 30 (Start time: 03:37:37 PM, 30 December 2020)

Total Marks: 1

 $x+2=3$ is a proposition?

Select the correct option

☒	True
☐	False

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Question # 19 of 30 (Start time: 03:45:03 PM, 30 December 2020)

Total Marks: 1

Q! = 1!

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Select the correct option

True

False

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Question # 4 of 30 (Start time: 03:32:33 PM, 30 December 2020)

Total Marks: 1

If $p \leftrightarrow q$ is True, then -----

Select the correct option

☐	Only p is True.	//
☐	Only q is True.	//
☒	p and q both are True.	
☐	None of these.	

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Question # 15 of 30 (Start time: 03:41:40 PM, 30 December 2020)

Total Marks: 1

Let p = Akram is rich, q = Akram is helpful. Then $\sim p \wedge q$ means -----

Select the correct option

☐	Akram is rich AND he is helpful.	
☐	Akram is rich BUT he is not helpful.	
☒	Akram is not rich BUT he is helpful.	
☐	Akram is rich OR he is helpful.	

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Question # 1 of 30 (Start time: 03:29:56 PM, 30 December 2020)

Total Marks: 1

Which of the following is the example of an alternating sequence?

Select the correct option

[Reload Math Equations](#)

$$C_n = \frac{1}{n} \text{ for } n > 0$$



$$C_n = \frac{n}{n+1} \text{ for } n \geq 0$$



$$C_n = \frac{(-1)^n}{n+2} \text{ for } n \geq 0$$



$$C_n = \frac{(-1)}{n+2} \text{ for } n \geq 0$$

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MTH202:Grand Quiz

Quiz Start Time

Question # 1 of 30 (Start time: 02:07:23 PM, 30 December 2020)

The switches in series acts just like _____.

Select the correct option

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☐	OR gate
☒	AND gate
☐	NOT gate
☐	None of these



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MTH202:Grand Quiz

Question # 2 of 30 (Start time: 02:07:46 PM, 30 December 2020)

If $x \equiv 17 \pmod{5}$ Which of the following integers are valid solution for x ?

Select the correct option

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☐	-44
☐	4
☐	8
☒	12



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MTH202:Grand Quiz

Quiz Start Time: 1

Question # 3 of 30 (Start time: 02:08:07 PM, 30 December 2020)

$(s \vee \sim s)$ is the -----.

Select the correct option

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☐	Contradiction
☐	Conjunction
☒	Tautology
☐	Contingency



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MTH202:Grand Quiz

Quiz Sta

Question # 4 of 30 (Start time: 02:08:31 PM, 30 December 2020)

Negation of tautology is contradiction.

Select the correct option

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True



False



Click to Save



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MTH202:Grand Quiz

Question # 5 of 30 (**Start time: 02:08:55 PM, 30 December 2020**)

Let p = I am hard working, q = I am intelligent. Then $\sim p \wedge q$ means -----

Select the correct option

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I am hard working AND I am intelligent.



I am NOT hard working BUT I am intelligent.



I am NOT hard working OR I am intelligent.



I am hard working AND I am NOT intelligent.



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Quiz

Question # 6 of 30 (Start time: 02:09:25 PM, 30 December 2020)

Which of the followings is the comprehensive answer of sentence $2+3 = 4$?

Select the correct option

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☐

It is a proposition/statement.

☐

It is not a proposition/statement.

☐

It is a true proposition/statement.

☒

It is a false proposition/statement.

Click to Save



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MTH202:Grand Quiz

Question # 7 of 30 (Start time: 02:09:48 PM, 30 December 2020)

Inverse of a surjective function is always a function.

Select the correct option

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True



False





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Quiz Start Time:

Question # 8 of 30 (Start time: 02:10:12 PM, 30 December 2020)

Which is not a binary operation on the set of natural numbers N ?

Select the correct option

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☐	Addition
☐	Multiplication
☒	Subtraction
☐	None of these.



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MTH202:Grand Quiz

Quiz Start Time: 02:0

Question # 9 of 30 (Start time: 02:10:39 PM, 30 December 2020)

Which of the following is true for the following sequence?

$$C_n = 1 - (-1)^n \text{ for all integers } n > 0$$

Select the correct option



☐	If n is even, then $C_n = 2$ and if n is odd, then $C_n = 0$	Sonu Ilyas Mughal
☒	If n is even, then $C_n = 0$ and if n is odd, then $C_n = 2$	
☐	If n is even, then $C_n = 2$ and if n is odd, then $C_n = 1$	
☐	If n is even, then $C_n = 1$ and if n is odd, then $C_n = 0$	



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MTH202:Grand Quiz

Quiz Start Time: 02:07

Question # 10 of 30 (Start time: 02:11:04 PM, 30 December 2020)

The domain of a relation R from A to B is symbolically written as:

Select the correct option

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$D(R) = \{a \text{ belongs to } A \text{ such that } (a,b) \text{ belongs to } R\}$



$D(R) = \{a \text{ belongs to } B \text{ such that } (a,b) \text{ belongs to } R\}$

Click to Save Answer & Move



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MTH202:Grand Quiz

Quiz Start Time: 02:07 PM, 30 Dec

Question # 11 of 30 (Start time: 02:11:41 PM, 30 December 2020)

Total

Let $A = \{0, 1, 2\}$ and $R = \{(0,2), (1,1), (2,0)\}$ be a relation on A . Then which of the following ordered pairs are needed to make it reflexive.

Select the correct option

☒	(0,0) and (2,2)	Sonu Ilyas Mughal
☐	(0,0) and (0,2)	
☐	(2,0) and (2,2)	
☐	(2,0) and (0,2)	

Click to Save Answer & Move to Next Q



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Quiz Start Time

Question # 12 of 30 (Start time: 02:12:05 PM, 30 December 2020)

Let $A = \{1, 2, 3, 4\}$ and define a relation R on A by $R = \{(1, 1), (1, 2), (1, 3), (2, 3)\}$.
Then which one of the following is a correct statement about R :

Select the correct option

☒	R is transitive	Sonu Ilyas Mughal
☐	R is reflexive	
☐	R is both transitive and reflexive	
☐	R is neither reflexive nor transitive	

Click to Save Answer



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MTH202:Grand Quiz

sec(s)

Quiz Start Time: 02:07 PM, 30 December 2

Question # 13 of 30 (Start time: 02:12:39 PM, 30 December 2020)

Total Mar

Let A be a non-empty set and $P(A)$ the power set of A. Define the "subset" relation, $\subseteq$, as follows: for all $X, Y \in P(A)$, $X \subseteq Y \Leftrightarrow \forall x$, iff $x \in X$ then $x \in Y$. Then $\subseteq$ is

Select the correct option

☒	$\subseteq$ is a partial order relation.
☐	$\subseteq$ is not a partial order relation.

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Click to Save Answer & Move to Next Question



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sec(s)

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Quiz Start Time: 02:07 PM, 30 December 2020

Question # 14 of 30 (Start time: 02:13:01 PM, 30 December 2020)

Total Marks: 1

Let p = I am a student; and q = I love to study mathematics, then the symbolic form for the statement "I am not a student but I love to study mathematics" is----

Select the correct option

[Reload Math Equations](#)

☒	$\sim p \wedge q$	Sonu Ilyas Mughal
☐	$p \wedge q$	
☐	$p \wedge \sim q$	
☐	$\sim p \vee q$	

[Click to Save Answer & Move to Next Question](#)



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Quiz Start Time:

Question # 15 of 30 (Start time: 02:13:24 PM, 30 December 2020)

If $f(x) = 2x$ and $g(x) = x$ then $g(f(x))$ is.....

Select the correct option

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x



$2x$



x^2



$2x^2$



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Quiz Start Time

Question # 16 of 30 (Start time: 02:13:52 PM, 30 December 2020)

Let C is defined as the set of all countries in the world then C is a

Select the correct option

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Finite set



Infinite set





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Question # 17 of 30 (Start time: 02:14:29 PM, 30 December 2020)

If p is false and q is true, then $\sim p$ biconditional q is _____.

Select the correct option

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True



False



Click to Save A



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Quiz Start Time: 02:07 PM, 30 December

Question # 18 of 30 (Start time: 02:14:53 PM, 30 December 2020)

Total Ma

Let g be a function defined by $g(x) = x + 1$. Then the composition of $(g \circ g)(x)$ is ____.

Select the correct option

[Reload Math Equati](#)

☐	x
☐	$x + 1$
☒	$x + 2$
☐	$x^2 + 2x + 1$

[Click to Save Answer & Move to Next Questi](#)



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Quiz Start Time: 02:

Question # 19 of 30 (Start time: 02:15:20 PM, 30 December 2020)

A graph of a function f is onto iff every horizontal line intersects the graph in at least one point.

Select the correct option

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True



False



Click to Save Answer & M



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Quiz Start

Question # 20 of 30 (Start time: 02:15:42 PM, 30 December 2020)

If $p = \text{True}$ and $q = \text{True}$ then the truth value of $p \oplus q$ will be

Select the correct option

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☐	True
☒	False

Click to Save A



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Quiz Start Time: 02:07 PM, 30

Question # 21 of 30 (Start time: 02:16:04 PM, 30 December 2020)

Which of the followings is the truth value of $\sim p$ iff $\sim q$, when p is true and q is false ?

Select the correct option

☐	True
☒	False

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Click to Save Answer & Move to N



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Question # 22 of 30 (Start time: 02:16:25 PM, 30 December 2020)

Let t be tautology, then $\sim(\sim t)$ is -----

Select the correct option

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☐	c , (where c is contradiction.)
☒	t
☐	$\sim t$
☐	None



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Quiz Start Time

Question # 23 of 30 (Start time: 02:16:46 PM, 30 December 2020)

Let $A = \{1, 2, 3, 4\}$ and define relation $R = \{(1, 1), (1, 3), (2, 4), (3, 1), (4, 2)\}$ on A then which of the following statement about R is true?

Select the correct option

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☐	R is transitive
☐	R is reflexive
☒	R is symmetric
☐	R is not symmetric



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sec(

Quiz Start Time: 02:07 PM, 30 December

Question # 24 of 30 (Start time: 02:17:12 PM, 30 December 2020)

Total Ma

Let $f(x) = x^2 - 1$ and $g(x) = x + 1$ define functions f and g from R to R , then $\left(\frac{f}{g}\right)(x)$ is ____.

Select the correct option

Reload Math Equat

☐	$x^2 - 1$ Sonu Ilyas Mughal
☒	$x - 1$
☐	$x^2 + 1$
☐	$x + 1$

Click to Save Answer & Move to Next Quest



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Quiz Start Time

Question # 25 of 30 (Start time: 02:17:36 PM, 30 December 2020)

The functions fog and gof are always equal.

Select the correct option

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True



False





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Quiz Start Time: 02:17:59 PM, 30 December 2020

Question # 26 of 30 (Start time: 02:17:59 PM, 30 December 2020)

The value of $6!$ = ____.

Select the correct option

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120



720



1020



5040

Click to Save Answer &



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Quiz 5

Question # 27 of 30 (Start time: 02:18:24 PM, 30 December 2020)

Let $p = I$ am not a student, then $\sim(\sim p)$ represents -----

Select the correct option

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☐	It is not that I am not a student.
☐	I am a student.
☒	I am not a student.
☐	None of these.



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Question # 28 of 30 (Start time: 02:18:48 PM, 30 December 2020)

If p is false and q is true, then $\sim p \wedge q$ is _____.

Select the correct option

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True



False





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Quiz Start

Question # 29 of 30 (Start time: 02:19:10 PM, 30 December 2020)

x belongs to A or x belongs to B , therefore x belongs to _____.

Select the correct option

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$A \cap B$



$A \cup B$



$A - B$



$A \oplus B$



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Q

Question # 30 of 30 (Start time: 02:19:33 PM, 30 December 2020)

If $p \rightarrow q$ is false then $\sim q \rightarrow \sim p$ will be

Select the correct option

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True



False



Click to



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Quiz Sta

Question # 1 of 30 (**Start time: 04:17:02 PM, 30 December 2020**)

A sequence whose terms alternate in sign is called
an _____.

Select the correct option

Sonu Ilyas Mughal

☐	Cauchy sequence
☐	Series
☒	Alternating sequence
☐	None of the above



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MTH202:Grand Quiz

Quiz Start Time

Question # 2 of 30 (Start time: 04:17:37 PM, 30 December 2020)

$0! = \dots$

Select the correct option

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☐	0
☒	1
☐	2
☐	undefine



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MTH202:Grand Quiz

Quiz Start Time

Question # 3 of 30 (Start time: 04:18:08 PM, 30 December 2020)

If r is a positive real number, then the value of r in $3.r.r = -27r$ is

Select the correct option

Sonu Ilyas Mughal

☐

-9

☐

+9

☐

0

☒

none of these



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MTH202:Grand Quiz

Quiz Start Time: 04:17 PM, 30 December

Question # 4 of 30 (Start time: 04:18:34 PM, 30 December 2020)

Total Marks

If A = set of students of virtual university
then A has been written in the.....

Select the correct option

☐	Tabular form
☐	Set builder form
☒	Descriptive form
☐	A is not a set

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[Click to Go to Previous Question](#) [Click to Go to Next Question](#)



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MTH202:Grand Quiz

Quiz Star

Question # 5 of 30 (Start time: 04:18:57 PM, 30 December 2020)

Cartesian product of two sets symbolically written as _____.

Select the correct option

Sonu Ilyas Mughal



$A \times B = \{(a, b) \mid a \notin A \text{ and } b \in B\}$



$A \times B = \{(a, b) \mid a \in A \text{ and } b \notin B\}$



$A \times B = \{(a, b) \mid a \in A \text{ and } b \in B\}$



$A \times B = \{(a, b) \mid a \notin A \text{ and } b \notin B\}$



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MTH202:Grand Quiz

Quiz Start Time: 04:17 PM, 30 Dec

Question # 6 of 30 (Start time: 04:19:20 PM, 30 December 2020)

Total

Let $X = \{1, 2, 3, 4\}$ and $Y = \{7, 8, 9\}$ and let f be function defined from X to Y such that f is onto then which of the following statement about f is true?

Select the correct option

☒	Co-domain of f must contain 1 element
☐	Co-domain of f must contain 2 elements
☐	Co-domain of f must contain 3 elements
☐	Co-domain of f must contain 4 elements

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Question # 7 of 30 (Start time: 04:19:44 PM, 30 December 2020)

Range of function $f(x) = \{e^x\}$ is.....

Select the correct option

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☐	Set of Real number
☐	Set of integers
☒	Set of positive Real numbers
☐	Set of negative Real number.



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MTH202:Grand Quiz

Quiz Start Time:

Question # 8 of 30 (Start time: 04:20:07 PM, 30 December 2020)

Which of the following is not true for an identity function?

Select the correct option

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The identity function is always an injective function.



The identity function is always a surjective function.



The identity function is always a bijective function



The identity function is always a constant function



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MTH202:Grand Quiz

Quiz Start Time

Question # 9 of 30 (Start time: 04:20:30 PM, 30 December 2020)

The logic gates OR and AND are unary operation on $\{0,1\}$.

Select the correct option

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True



False



Click to Save Answer



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MTH202:Grand Quiz

Question # 10 of 30 (Start time: 04:20:51 PM, 30 December 2020)

p is sufficient for q mean " $p \rightarrow q$ "

Select the correct option

☐	True
☒	False

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MTH202:Grand Quiz

Quiz S

Question # 11 of 30 (Start time: 04:21:11 PM, 30 December 2020)

'p is equivalent to q' means -----

Select the correct option

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p is not necessary but p is sufficient for q.



p is neither necessary nor sufficient for q.



p is necessary and sufficient for q.



p is necessary but not sufficient for q.



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MTH202:Grand Quiz

Quiz Start Time: 04:

Question # 12 of 30 (Start time: 04:21:34 PM, 30 December 2020)

If a set A contains n elements then the number of elements in its power set P(A) is

Select the correct option



☐	Sonu Ilyas Mughal
☐	n^2
☒	2^n
☐	n^0



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MTH202:Grand Quiz

Quiz Start Time: 04:

Question # 13 of 30 (Start time: 04:21:56 PM, 30 December 2020)

A function $f : R \rightarrow R$ defined by $f(x) = \sqrt{x}$ is a real valued function.

Select the correct option



☐	True
☒	False

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Click to Save Answer & M



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MTH202:Grand Quiz

Quiz 5

Question # 14 of 30 (Start time: 04:22:16 PM, 30 December 2020)

Which of the following is not a binary operation on the set of Integers?

Select the correct option

☐	Addition
☐	Subtraction
☐	Multiplication
☒	Division

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Click to Save



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MTH202:Grand Quiz

Quiz Start Time: 04:17 PM, 30

Question # 15 of 30 (Start time: 04:22:38 PM, 30 December 2020)

$x+a, x+3a, x+5a, \dots$
is a/an _____.

Select the correct option

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arithmetic sequence



geometric sequence



arithmetic series



geometric series

Click to Save Answer & Move to N



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MTH202:Grand Quiz

Quiz Start T

Question # 16 of 30 (Start time: 04:23:01 PM, 30 December 2020)

$(p \wedge q) \vee (p \wedge r)$ is logically equivalent to.....

Select the correct option

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$$p \wedge (q \vee r)$$



$$p \vee (q \wedge r)$$



$$\sim p \wedge (q \vee r)$$



$$p \wedge \sim (p \vee r)$$



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MTH202:Grand Quiz

Quiz Start Time: 04:17 PM, 30 Decem

Question # 17 of 30 (Start time: 04:23:26 PM, 30 December 2020)

Total

Let $f(x) = 3x$ and $g(x) = 3x - 2$ define functions f and g from R to R , then $(f + g)(x)$ is ____.

Select the correct option

Reload Math Eq

☐	$3x^2$
☒	$6x - 2$
☐	$9x - 2$
☐	$9x^2 - 6x$



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MTH202:Grand Quiz

Quiz Start

Question # 18 of 30 (Start time: 04:23:49 PM, 30 December 2020)

Range of a relation symbolically written as _____.

Select the correct option

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☐	$\text{Ran}(R) = \{a \in A \mid (a, b) \in R\}$
☒	$\text{Ran}(R) = \{b \in B \mid (a, b) \in R\}$
☐	$\text{Ran}(R) = \{b \notin B \mid (a, b) \in R\}$
☐	None of the above



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MTH202:Grand Quiz

Quiz Start Time: 04:24:15 PM, 30 December 2020

Question # 19 of 30 (Start time: 04:24:15 PM, 30 December 2020)

In the matrix representation of an irreflexive relation all the entries in the main diagonal are

Select the correct option

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0



1



2



3



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MTH202:Grand Quiz

Quiz Start Time: 04:17

Question # 20 of 30 (Start time: 04:24:35 PM, 30 December 2020)

Let A, B, C be subset of universal set U then $(A - B) - C$

Select the correct option



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$$(A \cup B) - C$$



$$(A - B) \cap C$$



$$A - (B - C)$$



$$(A \cup B) \cap C$$



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MTH202:Grand Quiz

Quiz Start Time:

Question # 21 of 30 (Start time: 04:25:01 PM, 30 December 2020)

The converse of the conditional statement 'If I live in Lahore, then I live in Punjab' is -----.

Select the correct option

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If I do Not live in Lahore, then I live in Punjab.



If I do Not live in Lahore, then I do Not live in Punjab.



If I live in Punjab, then I do Not live in Lahore.



If I live in Punjab, then I live in Lahore.



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MTH202:Grand Quiz

Question # 22 of 30 (Start time: 04:25:31 PM, 30 December 2020)

The set of all vowels in the English alphabet
 $V = \{a, e, i, o, u\}$ is _____.

Select the correct option

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☒	Tabular Form
☐	Descriptive Form
☐	Set builder Form
☐	Both a and b



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MTH202:Grand Quiz

Quiz Start

Question # 23 of 30 (Start time: 04:26:09 PM, 30 December 2020)

A function

$$f : X \rightarrow Y$$

that is both one to one and onto is called a

Select the correct option

☐	Injective function
☐	surjective function
☒	bijjective function
☐	None of these

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Quiz S

Question # 24 of 30 (Start time: 04:26:41 PM, 30 December 2020)

If the conclusion is true when the premises are true, the argument will be _____.

Select the correct option

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Valid



Invalid





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MTH202:Grand Quiz

Quiz Start Time: 04:17 PM, 30 Decen

Question # 25 of 30 (Start time: 04:27:06 PM, 30 December 2020)

Total

Let $A = \{0, 1\}$ and $B = \{1\}$. Let R and S be two binary relations on Cartesian product of A and B such that $R = \{(0, 1)\}$ and $S = \{(1, 1)\}$. Then $R \cap S =$ _____.

Select the correct option

☐	$\{0, 1\}$	Sonu Ilyas Mughal
☐	$\{1, 1\}$	
☐	$\{(0, 1)\}$	
☒	empty	

Click to Save Answer & Move to Next Qu



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MTH202:Grand Quiz

Quiz Start Time:

Question # 26 of 30 (Start time: 04:27:32 PM, 30 December 2020)

Neither Ali is a student, nor he is from Lahore. In the logical sentences, it can be written as -----.

Select the correct option

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$\sim p \vee \sim q$



$\sim p \wedge \sim q$



$p \wedge q$



$p \vee \sim q$



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MTH202:Grand Quiz

Quiz Start Time: 04:17 PM, 30 Decembe

Question # 27 of 30 (Start time: 04:27:59 PM, 30 December 2020)

Total M

Range of function

$$f(x) = |x|$$

will be

Select the correct option

Reload Math Equat

☐	Set of real numbers
☐	Set of whole numbers
☒	Set of positive real numbers
☐	Set of negative real numbers

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Click to Save Answer & Move to Next Quest



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MTH202:Grand Quiz

Quiz Start Time: 04:17 PM, 30 Decer

Question # 28 of 30 (Start time: 04:28:25 PM, 30 December 2020)

Total

Let $A = \{1, 2, 3, 4\}$ and let R and S be transitive binary relations on A defined as:
 $R = \{(1, 2), (1, 3), (2, 2), (3, 3), (4, 2), (4, 3)\}$ and $S = \{(2, 1), (2, 4), (3, 3)\}$ Then
 $R \cup S = \{(1, 2), (1, 3), (2, 1), (2, 2), (2, 4), (3, 3), (4, 2), (4, 3)\}$.

Select the correct option

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☐ R union S is transitive

☒ R union S is not transitive

Click to Save Answer & Move to Next Qu



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Quiz S

Question # 29 of 30 (Start time: 04:28:50 PM, 30 December 2020)

Let t be tautology, then $\sim(\sim t)$ is -----

Select the correct option

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☐	c , (where c is contradiction.)
☒	t
☐	$\sim t$
☐	None



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MTH202:Grand Quiz

Quiz Start Time: 04

Question # 30 of 30 (Start time: 04:29:14 PM, 30 December 2020)

Which relations below are not functions?

Select the correct option

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$\{(-1,2),(-4,51),(1,2),(8,-51)\}$



$\{(13,14),(13,5),(16,7),(18,13)\}$



$\{(3,90),(4,54),(6,71),(8,90)\}$



$\{(3,1),(4,54),(6,71),(9,91)\}$



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MTH202:Grand Quiz

Quiz Start Time: 06:23 PM, 30 Dec

Question # 1 of 30 (Start time: 06:23:20 PM, 30 December 2020)

Tot

If $x \equiv -10 \pmod{15}$ Which of the following integers are valid solution for x ?

Select the correct option

☒	5	Sonu Ilyas Mughal
☐	3	
☐	6	
☐	7	

Click to Save Answer & Move to Next Q



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MTH202:Grand Quiz

Quiz Start Time: 06:23 PM, 30 I

Question # 2 of 30 (Start time: 06:24:00 PM, 30 December 2020)

Every set is not a proper subset of itself.

Select the correct option

True



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False



Click to Save Answer & Move to Ne



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Quiz S

Question # 3 of 30 (Start time: 06:24:39 PM, 30 December 2020)

720 = ...

Select the correct option

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4!



5!



6!



7!

Click to Save



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MTH202:Grand Quiz

sec(s)
Quiz Start Time: 06:23 PM, 30 December 2

Question # 4 of 30 (Start time: 06:25:20 PM, 30 December 2020)

Total Mar

The domain of a relation R from A to B is symbolically written as:

Select the correct option

☒	$D(R) = \{a \text{ belongs to A such that } (a,b) \text{ belongs to R}\}$
☐	$D(R) = \{a \text{ belongs to B such that } (a,b) \text{ belongs to R}\}$

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Click to Save Answer & Move to Next Question



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MTH202:Grand Quiz

Quiz Start Time: 06:23 PM, 30 December 2020

Question # 5 of 30 (Start time: 06:25:46 PM, 30 December 2020)

Total Marks: 1

Let p be True and q be False, then $p \wedge \sim q$ is -----

Select the correct option

☒	True	Sonu Ilyas Mughal
☐	False	

Click to Save Answer & Move to Next Question



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Quiz Start T

Question # 6 of 30 (Start time: 06:26:19 PM, 30 December 2020)

The logic gate NOT is a uniary operation on $\{0, 1\}$.

Select the correct option

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True



False





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MTH202:Grand Quiz

Quiz Start Time

Question # 7 of 30 (Start time: 06:26:42 PM, 30 December 2020)

Recursive can be used in "generative" manner.

Select the correct option

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True



False





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MTH202:Grand Quiz

Quiz Start Time: 0

Question # 8 of 30 (Start time: 06:27:05 PM, 30 December 2020)

The _____ of the terms of a sequence forms a series.

Select the correct option

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☐	Multiplication
☒	Sum



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MTH202:Grand Quiz

Quiz Star

Question # 9 of 30 (Start time: 06:27:33 PM, 30 December 2020)

Number of one to one functions form $X=\{a,b\}$ to $Y=\{u,v\}$ are equal to

Select the correct option

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☐

3

☐

4

☐

5

☒

2



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MTH202:Grand Quiz

Quiz Start Time: 06:23 PM, 30 December 2020

Question # 10 of 30 (Start time: 06:27:56 PM, 30 December 2020)

Total Marks: 10

Let $A = \{a, b\}$ then $P(A) =$

Select the correct option

[Reload Math Equation](#)

☐	$\{\{a\}, \{b\}\}$
☐	$\{\phi, \{a\}, \{b\}\}$
☐	$\{\phi, \{a, b\}\}$
☒	$\{\phi, \{a\}, \{b\}, \{a, b\}\}$

[Click to Save Answer & Move to Next Question](#)



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Time Left sec(s)

MTH202:Grand Quiz

Quiz Start Time: 06:23 PM, 30 December 2020

Question # 11 of 30 (Start time: 06:28:21 PM, 30 December 2020)

Total Marks: 1

The number of elements in the power set of ϕ denoted by $P(\phi)$ is

Select the correct option

[Reload Math Equations](#)

☐	2	Sonu Ilyas Mughal
☒	1	
☐	0	
☐	n	

[Click to Save Answer & Move to Next Question](#)



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Quiz Sta

Question # 12 of 30 (Start time: 06:28:44 PM, 30 December 2020)

Let $A = \{1, 2, 3, \dots, 50\}$ and $B = \{2, 4, 6, 8, 10\}$.
Then the Cartesian product of A and B has _____ elements.

Select the correct option

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☐	5
☐	50
☐	100
☒	250



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MTH202:Grand Quiz

Quiz Start Time:

Question # 13 of 30 (Start time: 06:29:12 PM, 30 December 2020)

If $f^{-1}(x) = \frac{6-x}{2}$ then $f^{-1}(2)$ is

Select the correct option

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2



3



1



0



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Quiz Start Time

Question # 14 of 30 (Start time: 06:29:36 PM, 30 December 2020)

The relation "divides" on the set of integers is _____.

Select the correct option

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A symmetric relation



An antisymmetric relation



Neither symmetric nor antisymmetric



Both symmetric and antisymmetric



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Quiz Start Time: 06:23 PM, 30

Question # 15 of 30 (Start time: 06:29:58 PM, 30 December 2020)

Let $f : R \rightarrow R$ is one to one function then $c \cdot f, c \neq 0$ is also one to one function

Select the correct option

Reload M

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True



False



Click to Save Answer & Move to Ne



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MTH202:Grand Quiz

Quiz S

Question # 16 of 30 (Start time: 06:30:27 PM, 30 December 2020)

The inverse of the statement 'If it is rainy day, then I am going to school' is -----.

Select the correct option

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☐	If it is rainy day, then I am Not going to school
☒	If it is Not rainy day, then I am Not going to school
☐	If it is Not rainy day, then I am going to school
☐	If I am going to school, then it is rainy day



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MTH202:Grand Quiz

Quiz Start Time: 06:23 PM, :

Question # 17 of 30 (Start time: 06:30:47 PM, 30 December 2020)

Which of the following is a biconditional statement?

Select the correct option



$1+1 = 3$ if and only if earth is flat

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33 is not divisible by 4



If you get good grades then I will buy you a gift



He is neither playing nor reading

Click to Save Answer & Move to



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Quiz Start Time: 06:23 PM, 30 Decem

Question # 18 of 30 (Start time: 06:31:09 PM, 30 December 2020)

Tota

Inverse of a surjective function is always a function.

Select the correct option

True



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False



Click to Save Answer & Move to Next Qu



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MTH202:Grand Quiz

Quiz Start Time:

Question # 19 of 30 (Start time: 06:31:32 PM, 30 December 2020)

The statement 'Beijing is the capital of China AND Cairo is the capital of Egypt' is a

Select the correct option

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Conjunction.



Disjunction.



Negation.



Conditional.



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MTH202:Grand Quiz

Question # 20 of 30 (Start time: 06:31:53 PM, 30 December 2020)

A statement that no objects belong to the set, belongs to _____.

Select the correct option

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☐	Base
☐	Recursion
☒	Restriction
☐	None of the mentioned



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MTH202:Grand Quiz

Quiz Start Time

Question # 21 of 30 (Start time: 06:32:15 PM, 30 December 2020)

There is atleast one loop in the graph of an irreflexive relation.

Select the correct option

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True



False





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MTH202:Grand Quiz

Time Left

Quiz Start Time: 06:23 PM, 30 Dec

Question # 22 of 30 (Start time: 06:32:35 PM, 30 December 2020)

To

If $p = \text{true}$, $q = \text{false}$; then the truth value of

$$(p \vee \sim q) \rightarrow \sim p$$

will be

Select the correct option

Reload Math

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True



False



Click to Save Answer & Move to Next



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MTH202:Grand Quiz

Quiz Start Time: 06:23 P

Question # 23 of 30 (Start time: 06:32:57 PM, 30 December 2020)

"-" is a binary operation on the set of integers $\mathbb{Z}$.

Select the correct option

True



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False



Click to Save Answer & Move



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Quiz Sta

Question # 24 of 30 (Start time: 06:33:17 PM, 30 December 2020)

What is the truth value of the sentence?
'It rains if and only if there are clouds.'

Select the correct option

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True



False





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MTH202:Grand Quiz

Quiz Start

Question # 25 of 30 (Start time: 06:33:37 PM, 30 December 2020)

For the relation below to be a function, x cannot be what values?
 $\{(12, 14), (13, 5), (-2, 7), (x, 13)\}$

Select the correct option

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x cannot be 14, 5, or 7.



x cannot be 12, 13, or -2.



x cannot be 14, 7, or 13.



x cannot be 12, 13, or 2.



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MTH202:Grand Quiz

Qu

Question # 26 of 30 (Start time: 06:34:01 PM, 30 December 2020)

Let $A = \{1, 2, 3, 4\}$ and $R = \{(1, 1)(2, 2)(3, 3)(4, 4)\}$ then R is

Select the correct option

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☐	Transitive
☐	Symmetric
☐	Reflexive
☐	Options a,b,and c all true



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MTH202:Grand Quiz

Quiz !

Question # 27 of 30 (Start time: 06:34:23 PM, 30 December 2020)

$\sim(p \vee q) = \underline{\hspace{2cm}}$.

Select the correct option

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$\sim p \wedge \sim q$



$\sim p \vee \sim q$



$\sim p$ implies $\sim q$



$\sim p$ biconditional $\sim q$



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MTH202:Grand Quiz

Quiz Start Time: 06:34:46 PM, 30 December 2020

Question # 28 of 30 (Start time: 06:34:46 PM, 30 December 2020)

Domain of the relation $\{(0,1),(3,22),(90,34)\}$
is _____.

Select the correct option

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$\{0,1,3,22,90,34\}$



$\{0,3,90\}$



$\{1,22,34\}$



$\{0,1,3\}$



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Quiz Sta

Question # 29 of 30 (Start time: 06:35:07 PM, 30 December 2020)

Let $A = \{1, 2, 3, 4\}$ and let R and S be transitive binary relations on A defined as:
 $R = \{(1, 2), (1, 3), (2, 2), (3, 3), (4, 2), (4, 3)\}$ and $S = \{(2, 1), (2, 4), (3, 3)\}$ Then
 $R \cup S = \{(1, 2), (1, 3), (2, 1), (2, 2), (2, 4), (3, 3), (4, 2), (4, 3)\}$.

Select the correct option

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☐ R union S is transitive

☒ R union S is not transitive



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MTH202:Grand Quiz

Quiz Start Time: 06:23 PM, 30 Dec

Question # 30 of 30 (Start time: 06:35:35 PM, 30 December 2020)

To

Let A and B be subset of universal set U then $(A \cup B)^c =$

Select the correct option

[Reload Math](#)

☐

$$A \cup B$$

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☒

$$A^c \cap B^c$$

☐

$$A - B^c$$

☐

$$A^c \cup B^c$$

[Click to Save Answer & Move to Next](#)



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MTH202:Grand Quiz

Quiz S

Question # 1 of 30 (Start time: 07:13:09 PM, 30 December 2020)

For $(2x-3, 4y+2)=(1,10)$, what will be the value of x and y?

Select the correct option

☐	(1 , 2)	Sonu Ilyas Mughal
☐	(3 , 4)	
☒	(2 , 2)	
☐	None of these	

Click to Save



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MTH202:Grand Quiz

Quiz Start Time: 1

Question # 2 of 30 (Start time: 07:13:38 PM, 30 December 2020)

The composition of functions is always _____.

Select the correct option

☐	commutative	Sonu Ilyas Mughal
☒	associative	
☐	one-to-one	
☐	onto	



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MTH202:Grand Quiz

Quiz Start Time:

Question # 3 of 30 (Start time: 07:13:59 PM, 30 December 2020)

A function whose inverse function exists is called a/an _____.

Select the correct option

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injective



surjective



invertible



symmetric

Click to Save Answer



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MTH202:Grand Quiz

Quiz :

Question # 4 of 30 (Start time: 07:14:20 PM, 30 December 2020)

Negation of tautology is contradiction.

Select the correct option

Sonu Ilyas Mughal

True



False



Click to Save



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MTH202:Grand Quiz

Question # 5 of 30 (**Start time: 07:15:01 PM, 30 December 2020**)

A function whose range consists of only one element is called.....

Select the correct option

Sonu Ilyas Mughal

☒	Constant function
☐	Onto function
☐	One to one function
☐	Identity function



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MTH202:Grand Quiz

Quiz Start Time: 07:1

Question # 6 of 30 (Start time: 07:15:27 PM, 30 December 2020)

The 3rd term of the sequence

$$b_n = 5^n$$

is.....

Select the correct option



☐	5	Sonu Ilyas Mughal
☐	25	
☒	125	
☐	625	



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MTH202:Grand Quiz

Quiz Start Tim

Question # 7 of 30 (Start time: 07:15:48 PM, 30 December 2020)

What will be the fourth term of the following sequence $1/2$, $2/3$, $3/4$, ____?

Select the correct option

Sonu Ilyas Mughal



$6/7$



$4/5$



$5/6$



$7/8$



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MTH202:Grand Quiz

Quiz Start Time: 07:

Question # 8 of 30 (Start time: 07:16:10 PM, 30 December 2020)

For the relation below to be a function, x cannot be what values?
 $\{(12,14),(13,5),(-2,7),(x,13)\}$

Select the correct option

☐	x cannot be 14, 5, or 7.	Sonu Ilyas Mughal
☒	x cannot be 12, 13, or -2.	
☐	x cannot be 14, 7, or 13.	
☐	x cannot be 12, 13, or 2.	

Click to Save Answer & M



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MTH202:Grand Quiz

Quiz Start T

Question # 9 of 30 (Start time: 07:16:31 PM, 30 December 2020)

Let $S = R$ and define the "square" relation $R = \{(x, y) | x^2 = y^2\}$. The square relation is an _____ relation.

Select the correct option

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Equivalence relation



Not equivalence relation





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MTH202:Grand Quiz

Quiz S

Question # 10 of 30 (Start time: 07:16:54 PM, 30 December 2020)

Let R be a relation on a set A . If R is symmetric then its compliment is _____ -

Select the correct option

Sonu Ilyas Mughal



Reflexive



Irreflexive



Symmetric



Antisymmetric

Click to Save



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Qu

Question # 11 of 30 (**Start time: 07:17:15 PM, 30 December 2020**)

If f is defined recursively by $f(0) = -1$ and $f(n+1) = f(n) + 3$, then $f(1) = \dots\dots\dots$

Select the correct option

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☒	2
☐	3
☐	4
☐	5



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Quiz Sta

Question # 12 of 30 (Start time: 07:17:41 PM, 30 December 2020)

Let $X = \{1, 5, 9\}$ and $Y = \{3, 4, 7\}$. Define a function f from X to Y such that $f(1) = 7$, $f(5) = 3$, $f(9) = \dots\dots\dots$
Which is true for $f(9)$ to make it a one-to-one (injective) function?

Select the correct option

Sonu Ilyas Mughal



4



3



7



1

Click to Save A



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Quiz Sta

Question # 13 of 30 (Start time: 07:18:02 PM, 30 December 2020)

The disjunction of p and q is written as ----

Select the correct option

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$p \vee q$



$p \wedge q$



$p \text{ XOR } q$



None of these.



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MTH202:Grand Quiz

Quiz Start T

Question # 14 of 30 (Start time: 07:18:22 PM, 30 December 2020)

Let $A = \{1, 2, 3, 4\}$ and $R = \{(1, 1)(2, 2)(3, 3)(4, 4)\}$ then R is

Select the correct option

☐	Transitive
☐	Symmetric
☐	Reflexive
☒	Options a,b,and c all true

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Click to Save Ans



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MTH202:Grand Quiz

Quiz Start Time

Question # 15 of 30 (Start time: 07:18:45 PM, 30 December 2020)

If f and g are two one-to-one functions, then their composition that is $g \circ f$ is one-to-one.

Select the correct option

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True



False





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Qui

Question # 16 of 30 (Start time: 07:19:05 PM, 30 December 2020)

Which of the following is not a binary operation on the set of Integers?

Select the correct option

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☐	Addition
☐	Subtraction
☐	Multiplication
☒	Division



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MTH202:Grand Quiz

Quiz Start Time: 07:13 PM, 30

Question # 17 of 30 (Start time: 07:19:27 PM, 30 December 2020)

The matrix representation of an inverse relation can be obtained by taking the of the relational matrix.

Select the correct option

☐	Determinant
☐	inverse
☒	transpose
☐	adjoint

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Click to Save Answer & Move to



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MTH202:Grand Quiz

Quiz Start Time: 07:15

Question # 18 of 30 (Start time: 07:19:50 PM, 30 December 2020)

Which is not a binary operation on the set of natural numbers N ?

Select the correct option

☐	Addition
☐	Multiplication
☒	Subtraction
☐	None of these.

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Click to Save Answer & Move to Next Question



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MTH202:Grand Quiz

Quiz Start Time:

Question # 19 of 30 (Start time: 07:20:11 PM, 30 December 2020)

A graph of a function f is onto iff every horizontal line intersects the graph in at least one point.

Select the correct option

True



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False



Click to Save Answer



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Quiz S

Question # 20 of 30 (Start time: 07:20:33 PM, 30 December 2020)

Let $f(2) = 3$, $g(2) = 3$, $f(4) = 1$ and $g(4) = 2$ then the value of $f \circ g(4)$ is

Select the correct option

☐	1	Sonu Ilyas Mughal
☐	2	
☒	3	
☐	4	



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MTH202:Grand Quiz

Quiz Start Time: 07:13 PM, 30 Dec 2020

Question # 21 of 30 (Start time: 07:20:57 PM, 30 December 2020)

If $F_k = F_{k-1} + F_{k-2}$ then $F_0 = 1$, $F_1 = 2$, then $F_2 =$ ____.

Select the correct option

[Reload Ma](#)

☒	3
☐	4
☐	6
☐	5

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[Click to Save Answer & Move to Ne](#)



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MTH202:Grand Quiz

Quiz Start 1

Question # 22 of 30 (Start time: 07:21:19 PM, 30 December 2020)

The logical statement $p \wedge q$ means -----

Select the correct option

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$p \text{ OR } q$



$p \text{ Not } q$



$p \text{ AND } q$



$p \text{ XOR } q$

Click to Save Ans



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Question # 23 of 30 (Start time: 07:21:46 PM, 30 December 2020)

Let the set $A = \{1, 2, 3, 4\}$ Then the relation $\{(2, 4), (4, 2)\}$ is _____.

Select the correct option

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☐	Reflexive
☒	Symmetric
☐	AntiSymmetric
☐	Transitive



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Quiz Start T

Question # 24 of 30 (Start time: 07:22:08 PM, 30 December 2020)

The functions fog and gof are always equal.

Select the correct option

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True



False





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Quiz S

Question # 25 of 30 (Start time: 07:22:32 PM, 30 December 2020)

Associative law of union for three sets is

Select the correct option

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$$A \cup (B \cup C) = (A \cup B) \cup C$$



$$A \cap (B \cap C) = (A \cap B) \cap C$$



$$A \cup (B \cap C) = (A \cup B) \cap (A \cup C)$$



None of these



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Qui

Question # 26 of 30 (Start time: 07:22:59 PM, 30 December 2020)

A union $B = B \cup A$, A intersection $B = B \cap A$, are called _____

Select the correct option

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Idempotent Laws



Commutative Laws



Associative Laws



Distributive Laws



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Quiz Sta

Question # 27 of 30 (Start time: 07:23:23 PM, 30 December 2020)

Let R be a binary relation on a set A . If R is anti symmetric then _____.

Select the correct option

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Inverse of R is symmetric



Inverse of R is anti symmetric

Click to Save



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Quiz Start Time: 0

Question # 28 of 30 (Start time: 07:23:45 PM, 30 December 2020)

'p is equivalent to q' means -----

Select the correct option

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p is not necessary but p is sufficient for q.



p is neither necessary nor sufficient for q.



p is necessary and sufficient for q.



p is necessary but not sufficient for q.



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Quiz Start Time: 07:

Question # 29 of 30 (Start time: 07:24:19 PM, 30 December 2020)

Negation of $2 < x < 3$ is -----

Select the correct option



$2 > x \text{ OR } x < 3$

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$2 > x \text{ AND } x > 3$



$2 > x \text{ OR } x > 3$



$2 > x \text{ XOR } x > 3$

Click to Save Answer & M



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Quiz Start Time: 07:

Question # 30 of 30 (Start time: 07:24:43 PM, 30 December 2020)

Which of the following is a right biconditional statement_____.

Select the correct option

☒	It rains if and only if it is a weekend.	Sonu Ilyas Mughal
☐	The number is divisible by 6 if it is divisible by 2 and 3.	
☐	If it rains there will be a holiday.	
☐	It is hot outside and I will buy an ice cream.	

Click to Save Answer & M



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- 8) Solved Graded Activities
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Detailed
Information

Project Enrolment Complete training with Live classes on Zoom

- 1) SRS (Software Requirements Specification)
- 2) DD (Design Document)
- 3) Test phase
 - a) Test phase viva (Live Classes for viva preparation)
- 4) Final Deliverable
 - a) Final coding
 - b) Final presentation
 - c) Final report
 - d) Pre final viva (Coding Viva)
 - e) Final viva (Overall Presentation)

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Subjects Enrolment

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- 2) Written Lectures (pdf)
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- 4) Topic wise Notes
- 5) Short QA Solved
- 6) MCQs Solved
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Activity
Detailed
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BC190400671: MUHAMMAD RAEES

MTH202:Grand Quiz

Time Left32 sec(s)

Quiz Start Time: 03:07 PM, 30 December 2020

Question # 2 of 30 (Start time: 03:09:20 PM, 30 December 2020)

Total Marks: 1

Let s be True and r be True, then ($\sim$ s AND r) is -----.

Select the correct option

☐

t (where t is tautology.)

☐

c (where c is contradiction.)

☐

True

☒

False

Click to Save Answer & Move to Next Question

Windows taskbar: 3:10 PM 12/30/2020

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MTH202:Grand Quiz

Time Left43 sec(s)

Quiz Start Time: 03:07 PM, 30 December 2020

Question # 3 of 30 (Start time: 03:10:30 PM, 30 December 2020)

Total Marks: 1

The process of defining an object in terms of smaller versions of itself is called recursion.

Select the correct option

☒

True

☐

False

Click to Save Answer & Move to Next Question

Windows taskbar: 3:11 PM 12/30/2020

Quiz List

Quiz

Let s be True and r be True, then

Let A and B be subset of univers

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MTH202:Grand Quiz

Time Left 26 sec(s)

Quiz Start Time: 03:07 PM, 30 December 2020

Question # 4 of 30 (Start time: 03:11:26 PM, 30 December 2020)

Total Marks: 1

A function $f : R \rightarrow R$ defined by $f(x) = \sqrt{x}$ is a real valued function.

Select the correct option

Reload Math Equations

☐

True

☒

False

Click to Save Answer & Move to Next Question

Quiz List

Quiz

Which of the following is not

Let s be True and r be True, th

Let A and B be subset of univ

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MTH202:Grand Quiz

Time Left 41 sec(s)

Quiz Start Time: 03:07 PM, 30 December 2020

Question # 5 of 30 (Start time: 03:12:40 PM, 30 December 2020)

Total Marks: 1

Which of the following is not a binary operation on the set of Integers?

Select the correct option

☐

Addition

☐

Subtraction

☐

Multiplication

☒

Division

Click to Save Answer & Move to Next Question

Quiz List

Quiz

Which of the following is not

Let s be True and r be True, th

Let A and B be subset of univ

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Time Left

20

sec(s)

MTH202:Grand Quiz

Quiz Start Time: 03:07 PM, 30 December 2020

Question # 6 of 30 (Start time: 03:13:43 PM, 30 December 2020)

Total Marks: 1

If a is the 1st term and d be the common difference of an arithmetic sequence, then the sequence is $a, a+d, a+2d, a+3d, \dots$

Select the correct option

☐

True

☐

False

▶

Click to Save Answer & Move to Next Question

Quiz List

Quiz

Which of the following is not

Let s be True and r be True, th

Let A and B be subset of univ

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Time Left

72

sec(s)

MTH202:Grand Quiz

Quiz Start Time: 03:07 PM, 30 December 2020

Question # 7 of 30 (Start time: 03:14:59 PM, 30 December 2020)

Total Marks: 1

A={Birds living on the earth} is ----- set.

Select the correct option

☐

a finite

☒

an infinite

▶

Click to Save Answer & Move to Next Question

Quiz List

Quiz

Which of the following is not

Let s be True and r be True, th

Let A and B be subset of univ

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Quiz ListQuizLet $X = \{1, 2, 3, 4\}$ A = {Birds living in MTH202 D404: Not FWhich of tLet s be TLet A and

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MTH202:Grand Quiz

Time Left 20 sec(s)

Quiz Start Time: 03:07 PM, 30 December 2020

Question # 9 of 30 (Start time: 03:17:24 PM, 30 December 2020)

Total Marks: 1

Let $X = \{1, 2, 3, 4\}$ and a function 'f' defined from X to X by $f(1) = 1, f(2) = 1, f(3) = 1, f(4) = 1$ then which of the following is true?

Select the correct option

☒

f is an identity function

☐

f is a constant function

☐

f is bijective

☐

f is injective

Click to Save Answer & Move to Next Question

WindowsTaskbar

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MTH202:Grand Quiz

Time Left 42 sec(s)

Quiz Start Time: 03:07 PM, 30 December 2020

Question # 10 of 30 (Start time: 03:18:45 PM, 30 December 2020)

Total Marks: 1

"-" is a binary operation on the set of integers $\mathbb{Z}$.

Select the correct option

☒

True

☐

False

Click to Save Answer & Move to Next Question

WindowsTaskbar

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Time Left 41 sec(s)

MTH202:Grand Quiz

Quiz Start Time: 03:07 PM, 30 December 2020

Question # 11 of 30 (Start time: 03:19:38 PM, 30 December 2020)

Total Marks: 1

Define a relation $R = \{(1,1), (2,2), (3,3), (1,3)\}$ then relation is _____.

Select the correct option

- ☒ R is reflexive and transitive
- ☐ R is not reflexive and transitive
- ☐ R is reflexive and not transitive
- ☐ R is not reflexive and not transitive

Click to Save Answer & Move to Next Question

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Time Left 20 sec(s)

MTH202:Grand Quiz

Quiz Start Time: 03:07 PM, 30 December 2020

Question # 12 of 30 (Start time: 03:20:42 PM, 30 December 2020)

Total Marks: 1

If $p \rightarrow q$ is False, then Truth value of $p \leftrightarrow q$ is _____.

Select the correct option

- ☒ True
- ☐ False

Click to Save Answer & Move to Next Question

Question # 17 of 30 (Start time: 03:28:44 PM, 30 December 2020)

Total Marks: 1

Let $A = \{1, 2, 3, 4\}$ and $R = \{(1, 2), (2, 3), (3, 3), (3, 4)\}$ be a relation on A . Then which one of the following ordered pair has made R not an irreflexive relation?

- Select the correct option
- ☐ (1,2)
 - ☐ (2,3)
 - ☒ (3,3)
 - ☐ (3,4)

Click to Save Answer & Move to Next Question

Question # 18 of 30 (Start time: 03:30:22 PM, 30 December 2020)

Total Marks: 1

If the partition set of A is $\{A_1, A_2\}$ then

- Select the correct option
- Reload Math Equations
- ☐ $A_1 \cup A_2 = \phi$
 - ☐ $A_1 \cap A_2 = \phi$
 - ☐ $A_1^c \cup A_2^c = A$
 - ☐ $A_1 \cap A_2 = A$

[Click to Save Answer & Move to Next Question](#)

Question # 19 of 30 (Start time: 03:32:07 PM, 30 December 2020) Total Marks: 1

If R is transitive then the inverse relation will be transitive.

Select the correct option

- ☒ true
- ☐ false

Click to Save Answer & Move to Next Question

Question # 20 of 30 (Start time: 03:33:36 PM, 30 December 2020) Total Marks: 1

The value of $6!$ = ____.

Select the correct option

- ☐ 120
- ☒ 720
- ☐ 1020
- ☐ 5040

Click to Save Answer & Move to Next Question

Question # 21 of 30 (Start time: 03:34:20 PM, 30 December 2020) Total Marks: 1

Which of the following is the example of an alternating sequence?

Select the correct option

Reload Math Equations

- ☐ $C_n = \frac{1}{n} \text{ for } n > 0$
- ☐ $C_n = \frac{n}{n+1} \text{ for } n \geq 0$
- ☒ $C_n = \frac{(-1)^n}{n+2} \text{ for } n \geq 0$
- ☐ $C_n = \frac{(-1)}{n+2} \text{ for } n \geq 0$

Question # 22 of 30 (Start time: 03:35:31 PM, 30 December 2020) Total Marks: 1

Let A={1,2,3} and B = {2,4} then number of binary relations from A to B are _____.

Select the correct option

- ☒ 6
- ☐ 9
- ☐ 16
- ☐ 64

Question # 23 of 30 (Start time: 03:36:47 PM, 30 December 2020) Total Marks: 1

If (p XOR q) is True, then -----

Select the correct option

- ☒ p is True, q is True.
- ☐ p is False, q is True.
- ☐ p is False, q is False.
- ☐ None

Click to Save Answer & Move to Next Question

Question # 24 of 30 (Start time: 03:38:27 PM, 30 December 2020) Total Marks: 1

Number of one to one functions form $X=\{a,b\}$ to $Y=\{u,v\}$ are equal to

Select the correct option

- ☐ 3
- ☐ 4
- ☐ 5
- ☒ 2

Click to Save Answer & Move to Next Question

Question # 25 of 30 (Start time: 03:39:57 PM, 30 December 2020) Total Marks: 1

Set Difference Law is _____.

Select the correct option

Reload Math Equations

☒	$A - B = A \cap B^c$
☐	$A - B = A^c \cap B$
☐	$A - B = A \cap B$
☐	$A - B = B \cap A$

Question # 26 of 30 (Start time: 03:41:20 PM, 30 December 2020) Total Marks: 1

If n is a positive integer, then $n! = n$ for n =.....

Select the correct option

☐	0,1,2
☐	0,1
☐	1,2
☒	1

Question # 27 of 30 (Start time: 03:42:08 PM, 30 December 2020) Total Marks: 1

Let the set $A = \{1, 2, 3, 4\}$ Then the relation $\{(2, 4), (4, 2)\}$ is _____

- Select the correct option
- ☐ Reflexive
 - ☒ Symmetric
 - ☐ AntiSymmetric
 - ☐ Transitive

Click to Save Answer & Move to Next Question

Question # 28 of 30 (Start time: 03:42:56 PM, 30 December 2020) Total Marks: 1

Let $X = \{1, 2, 3, 4\}$ and $Y = \{7, 8, 9\}$ and let f be function defined from X to Y such that f is onto then which of the following statement about f is true?

- Select the correct option
- ☒ Co-domain of f must contain 1 element
 - ☐ Co-domain of f must contain 2 elements
 - ☐ Co-domain of f must contain 3 elements
 - ☐ Co-domain of f must contain 4 elements

Click to Save Answer & Move to Next Question

Question # 29 of 30 (Start time: 03:44:49 PM, 30 December 2020)

Total Marks: 1

Determine values of x and y, where $(2x, x + y) = (8, 6)$.

Select the correct option

- ☐ x=3 and y=5
- ☒ x=4 and y=2
- ☐ x=6 and y=12
- ☐ x=4 and y=12

Click to Save Answer & Move to Next Question

Question # 30 of 30 (Start time: 03:45:35 PM, 30 December 2020)

Total Marks: 1

What is the Truth value of the sentence?

8 divides 64 if and only if 2 divides 8.

Select the correct option

- ☒ True
- ☐ False

Click to Save Answer & Move to Next Question

Question # 1 of 30 (Start time: 07:47:15 PM, 30 December 2020) Total Marks: 1

If a relation R is reflexive, anti symmetric and transitive then which of the following is not true for the inverse relation.

- Select the correct option
- ☐ inverse relation will be reflexive.
 - ☐ inverse relation will be irreflexive.
 - ☐ inverse relation will be transitive.
 - ☒ inverse relation will be anti symmetric.

Saving...

Question # 2 of 30 (Start time: 07:48:54 PM, 30 December 2020) Total Marks: 1

Let $X = \{1, 2, 3, 4\}$ and $Y = \{7, 8, 9\}$ and let f be function defined from X to Y such that f is onto then which of the following statement about f is true?

- Select the correct option
- ☒ Co-domain of f must contain 1 element
 - ☐ Co-domain of f must contain 2 elements
 - ☐ Co-domain of f must contain 3 elements
 - ☐ Co-domain of f must contain 4 elements

Click to Save Answer & Move to Next Question

MC200401011: SHAHEEN QADIR

MTH202:Grand Quiz

Time Left 43 sec(s)

Quiz Start Time: 07:47 PM, 30 December 2020

Question # 3 of 30 (Start time: 07:50:12 PM, 30 December 2020)

Total Marks: 1

The properties of being symmetric and being anti-symmetric are _____

Select the correct option

☐

Negative of each other

☒

Not negative of each other

Click to Save Answer & Move to Next Question

MC200401011: SHAHEEN QADIR

MTH202:Grand Quiz

Time Left 29 sec(s)

Quiz Start Time: 07:47 PM, 30 December 2020

Question # 4 of 30 (Start time: 07:51:18 PM, 30 December 2020)

Total Marks: 1

Let $A = \{1,2,3\}$ and $B = \{0,1,2\}$ and $C = \{a,b\}$
 $R = \{(1,0),(1,2),(3,1),(3,2)\}$
 $S = \{(0,b),(1,a),(2,b)\}$
Composite of R and S = _____

Select the correct option

☐

$\{(1,a),(2,a),(3,a)\}$

☒

$\{(1,b),(1,a),(3,a),(3,b)\}$

☐

$\{(1,a),(1,b),(2,a),(3,b)\}$

☐

$\{(1,b),(3,a),(3,b)\}$

Click to Save Answer & Move to Next Question

Question # 5 of 30 (Start time: 07:52:25 PM, 30 December 2020) Total Marks: 1

The sum of first five whole numbers is.....

Select the correct option

- ☐ 5
- ☐ 15
- ☒ 10
- ☐ 0

Click to Save Answer & Move to Next Question

Question # 7 of 30 (Start time: 07:54:52 PM, 30 December 2020) Total Marks: 1

The set Z of all integers is _____.

Select the correct option

- ☐ uncountable
- ☒ countable

Click to Save Answer & Move to Next Question

Quiz List

Quiz

If $F_k = F_{k-1} + F_{k-2}$ then F_0

$\{(x,y)|x^2=y^2\} \{(x,y)|x^2=y^2\}$ Equiv

Let $X = \{1,2,3,4\}$ and $Y = \{7,8,9\}$

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MC200401011: SHAHEEN QADIR

MTH202:Grand Quiz

Time Left 21 sec(s)

Quiz Start Time: 07:47 PM, 30 December 2020

Question # 10 of 30 (Start time: 07:57:00 PM, 30 December 2020)

Total Marks: 1

If $F_k = F_{k-1} + F_{k-2}$ then $F_0 = 1, F_1 = 2$, then $F_2 = \underline{\hspace{1cm}}$.

Select the correct option

Reload Math Equations

☒

3

☐

4

☐

6

☐

5

Quiz List

Quiz

Generally, $(p \vee t)$

Generally, $(p \vee t)$

If $F_k = F_{k-1} + F_{k-2}$

$\{(x,y)|x^2=y^2\} \{(x,y)|x^2=y^2\}$

Let $X = \{1,2,3,4\}$ and

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MC200401011: SHAHEEN QADIR

MTH202:Grand Quiz

Time Left 6 sec(s)

Quiz Start Time: 07:47 PM, 30 December 2020

Question # 12 of 30 (Start time: 07:59:28 PM, 30 December 2020)

Total Marks: 1

Generally, $(p \vee t)$ is -----

Select the correct option

☐

t (where t is tautology.)

☒

p

Click to Save Answer & Move to Next Question

MC200401011: SHAHEEN QADIR

MTH202:Grand Quiz

Time Left 62 sec(s)

Quiz Start Time: 07:47 PM, 30 December 2020

Question # 13 of 30 (Start time: 08.01:21 PM, 30 December 2020)

Total Marks: 1

If r is a positive real number, then the value of r in $3.r.r = -27r$ is

Select the correct option

☐ -9

☒ +9

☐ 0

☐ none of these

Click to Save Answer & Move to Next Question

MC200401011: SHAHEEN QADIR

MTH202:Grand Quiz

Time Left 79 sec(s)

Quiz Start Time: 07:47 PM, 30 December 2020

Question # 14 of 30 (Start time: 08.02:01 PM, 30 December 2020)

Total Marks: 1

Which of the following is always true for the matrix representation of a symmetric relation?

Select the correct option

☐ Matrix has always 0 in its diagonal entries

☐ Matrix is equal to its transpose.

☒ Matrix has always 1 in its diagonal entries

☐ Matrix is singular

Click to Save Answer & Move to Next Question

Question # 15 of 30 (Start time: 08:02:21 PM, 30 December 2020)

Total Marks: 1

Let A be a set with m elements and B be a set with n elements then the number of elements in

$$A \times B$$

are _____

Select the correct option

Reload Math Equations

☐	2^m
☐	m^n
☐	n^m
☒	$m \cdot n$

[Click to Save Answer & Move to Next Question](#)

MC200401011: SHAHEEN QADIR

Time Left 84 sec(s)

MTH202:Grand Quiz

Quiz Start Time: 07:47 PM, 30 December 2020

Question # 16 of 30 (Start time: 08:02:45 PM, 30 December 2020)

Total Marks: 1

$\sim p$ is True when -----

Select the correct option

	p is False.
	p is True.

[Click to Save Answer & Move to Next Question](#)

MC200401011: SHAHEEN QADIR

MTH202:Grand Quiz

Time Left 31 sec(s)

Quiz Start Time: 07:47 PM, 30 December 2020

Question # 17 of 30 (Start time: 08:02:59 PM, 30 December 2020)

Total Marks: 1

The switches in series acts just like ____.

Select the correct option

☐

OR gate

☒

AND gate

☐

NOT gate☐

Click to Save Answer & Move to Next Question

MC200401011: SHAHEEN QADIR

MTH202:Grand Quiz

Time Left 86 sec(s)

Quiz Start Time: 07:47 PM, 30 December 2020

Question # 18 of 30 (Start time: 08:04:25 PM, 30 December 2020)

Total Marks: 1

Universal bound law states that _____.

Select the correct option

☒

 $p \vee t = t$

☐

 $p \vee t = p$ ☐☐

Reload Math Equations

Question # 19 of 30 (Start time: 08:04:36 PM, 30 December 2020) Total Marks: 1

$$y = \sqrt{x}$$

is an function form

Select the correct option Reload Math Equations

- ☐ one to one
- ☒ onto
- ☐ both of above
- ☐ None of these.

Click to Save Answer & Move to Next Question

Time Left 36 sec(s) Quiz Start Time: 07:47 PM, 30 December 2020

MTH202:Grand Quiz

Question # 20 of 30 (Start time: 08:05:44 PM, 30 December 2020) Total Marks: 1

The domain of a relation R from A to B is symbolically written as:

Select the correct option

- ☒ $D(R) = \{a \text{ belongs to } A \text{ such that } (a,b) \text{ belongs to } R\}$
- ☐ $D(R) = \{a \text{ belongs to } B \text{ such that } (a,b) \text{ belongs to } R\}$

Click to Save Answer & Move to Next Question

MC200401011: SHAHEEN QADIR

MTH202:Grand Quiz

Time Left 27 sec(s)

Quiz Start Time: 07:47 PM, 30 December 2020

Question # 21 of 30 (Start time: 08:06:50 PM, 30 December 2020)

Total Marks: 1

The set of the number less than 10 and more than 1 is _____.

Select the correct option

☒

Tabular Form

☐

Descriptive Form

☐

Set builder Form☐

Click to Save Answer & Move to Next Question

MC200401011: SHAHEEN QADIR

MTH202:Grand Quiz

Time Left 85 sec(s)

Quiz Start Time: 07:47 PM, 30 December 2020

Question # 22 of 30 (Start time: 08:08:14 PM, 30 December 2020)

Total Marks: 1

Let $p \rightarrow q$ be a conditional statement, then $\sim p \rightarrow \sim q$ is called -----

Select the correct option

☒

Inverse

☐

Converse☐☐

Click to Save Answer & Move to Next Question

Quiz List

Quiz

The set

$y=x-v$

If r is a p

General

General

If $F_k = F$

$(xy)kx^2 =$

Let $X =$

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MC200401011: SHAHEEN QADIR

MTH202:Grand Quiz

Time Left 90 sec(s)

Quiz Start Time: 07:47 PM, 30 December 2020

Question # 24 of 30 (Start time: 08:09:56 PM, 30 December 2020)

Total Marks: 1

Let $A = \{1,2,3,4\}$ and define the following relations on A Then $R = \{(1,3), (1,4), (2,3), (2,4), (3,1), (3,4)\}$ is _____.

Select the correct option

☐

R is reflexive

☐

R is irreflexive

☐

R is both reflexive and irreflexive

☐

None of the above

Waiting for quiz...

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Quiz List

Quiz

The set

$y=x-v$

If r is a p

General

General

If $F_k = F$

$(xy)kx^2 =$

Let $X =$

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MC200401011: SHAHEEN QADIR

MTH202:Grand Quiz

Time Left 52 sec(s)

Quiz Start Time: 07:47 PM, 30 December 2020

Question # 24 of 30 (Start time: 08:09:56 PM, 30 December 2020)

Total Marks: 1

Let $A = \{1,2,3,4\}$ and define the following relations on A Then $R = \{(1,3), (1,4), (2,3), (2,4), (3,1), (3,4)\}$ is _____.

Select the correct option

☐

R is reflexive

☒

R is irreflexive

☐

R is both reflexive and irreflexive

☐

None of the above

Click to Save Answer & Move to Next Question

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MC200401011: SHAHEEN QADIR

Time Left 50 sec(s)

MTH202:Grand Quiz

Quiz Start Time: 07:47 PM, 30 December 2020

Question # 25 of 30 (Start time: 08:11:02 PM, 30 December 2020)

Total Marks: 1

Associative law of union for three sets is

Select the correct option

Reload Math Equations

☐ $A \cup (B \cup C) = (A \cup B) \cup C$

☒ $A \cap (B \cap C) = (A \cap B) \cap C$

☐ $A \cup (B \cap C) = (A \cup B) \cap (A \cup C)$

☐ None of these

MC200401011: SHAHEEN QADIR

Time Left 53 sec(s)

MTH202:Grand Quiz

Quiz Start Time: 07:47 PM, 30 December 2020

Question # 26 of 30 (Start time: 08:11:58 PM, 30 December 2020)

Total Marks: 1

The biconditional statement for the following statement would be _____

Select the correct option

☐ This number is divisible by 6 then it is divisible by 2 and 3.☒ This number is divisible by 6 if and only if it is divisible by both 2 and 3.☐ This number is divisible by 2 and 3 then it is divisible by 6.☐ This number is divisible by 2 if it is divisible by 3 and 6.

Click to Save Answer & Move to Next Question

Question # 27 of 30 (Start time: 08:12:45 PM, 30 December 2020) Total Marks: 1

Determine values of x and y, where $(2x, x + y) = (8, 6)$.

Select the correct option

- ☐ x=3 and y=5
- ☒ x=4 and y=2
- ☐ x=6 and y=12
- ☐ x=4 and y=12

Click to Save Answer & Move to Next Question

Question # 28 of 30 (Start time: 08:13:35 PM, 30 December 2020) Total Marks: 1

Vertical line test is used to determine that whether the graph of a relation is a function or not.

Select the correct option

- ☒ True
- ☐ False

Click to Save Answer & Move to Next Question

Question # 29 of 30 (Start time: 08:14:42 PM, 30 December 2020) Total Marks: 1

If $A = \{1, 2, 3\}$ is a set and $R = \{(2, 3), (2, 2), (3, 4)\}$ is a relation on A, then R is

Select the correct option [Reload Math Equations](#)

☐	Transitive
☐	Symmetric
☐	Reflexive
☐	None of these

Question # 30 of 30 (Start time: 08:16:01 PM, 30 December 2020) Total Marks: 1

The functions fog and gof are always equal.

Select the correct option

☐	True
☐	False

[Click to Save Answer & Move to Next Question](#)

MC200401532: SADIA BATOOL

MTH202:Grand Quiz

Time Left 79 sec(s)

Quiz Start Time: 10:23 PM, 30 December 2020

Question # 1 of 30 (Start time: 10:23:43 PM, 30 December 2020)

Total Marks: 1

Which of the followings is the truth value of the compound statement, $x > 5$ iff $(x^2) > 25$?

Select the correct option

☒

True

☐

False

Click to Save Answer & Move to Next Question

MC200401532: SADIA BATOOL

MTH202:Grand Quiz

Time Left 73 sec(s)

Quiz Start Time: 10:23 PM, 30 December 2020

Question # 2 of 30 (Start time: 10:23:59 PM, 30 December 2020)

Total Marks: 1

A sequence whose terms alternate in sign is called an _____.

Select the correct option

☐Cauchy sequence

☐Series

☒Alternating sequence

☐None of the above

Click to Save Answer & Move to Next Question

MC200401532: SADIA BATOOL

Time Left 51 sec(s)

MTH202:Grand Quiz

Quiz Start Time: 10:23 PM, 30 December 2020

Question # 3 of 30 (Start time: 10:24:25 PM, 30 December 2020)

Total Marks: 1

Let $A = \{2, 3, 5, 7\}$
 $B =$ set of first four odd numbers
 $C =$ set of first four prime numbers.
 Then from the following which statement is true ?

Select the correct option

☐	$A=B$
☒	$A=C$
☐	$B=C$
☐	None of above

Click to Save Answer & Move to Next Question

MTH202:Grand Quiz

Quiz Start Time: 10:23 PM, 30 December 2020

Question # 4 of 30 (Start time: 10:25:15 PM, 30 December 2020)

Total Marks: 1

Let A and B be subset of universal set U then $(A \cap B)^c =$

Select the correct option

Reload Math Equations

☐	$A \cup B$
☐	$A \cap B$
☐	$A - B^c$
☒	$A^c \cup B^c$

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MC200401532: SADIA BATOOL

Time Left 23 sec(s)

MTH202:Grand Quiz

Quiz Start Time: 10:23 PM, 30 December 2020

Question # 5 of 30 (Start time: 10:25:47 PM, 30 December 2020)

Total Marks: 1

Let f be a function from $X = \{2, 4, 5\}$ to $Y = \{1, 2, 4, 6\}$ defined as: $f = \{(2, 6), (4, 2), (5, 1)\}$. Then range of f is _____.

Select the correct option

☐

1,2,6

☐

2,4,5

☒

{1,2,6}

☐

{2,4,5}

Click to Save Answer & Move to Next Question

Quiz List

Quiz

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MC200401532: SADIA BATOOL

Time Left 81 sec(s)

MTH202:Grand Quiz

Quiz Start Time: 10:23 PM, 30 December 2020

Question # 7 of 30 (Start time: 10:27:27 PM, 30 December 2020)

Total Marks: 1

Which of the following is not a type of a Relation?

Select the correct option

☐

Reflexive

☐

Symmetric

☐

Transitive

☒

Permutation

Click to Save Answer & Move to Next Question

Quiz List

Quiz

A sequence whose terms alterna

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Quiz List

Quiz

~(p ^ q) = ____ . MTH202 - Goc

A sequence whose terms altern

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MC200401532: SADIA BATOOL

MTH202:Grand Quiz

Time Left 66 sec(s)

Quiz Start Time: 10:23 PM, 30 December 2020

Question # 8 of 30 (Start time: 10:27:43 PM, 30 December 2020)

Total Marks: 1

~(p ^ q) = ____

Select the correct option

☐

~p v ~q

☒

~p ^ ~q

☐

~p implies ~q

☐

~p biconditional ~q

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Quiz List

Quiz

~(p ^ q) = ____ . MTH202 - Goc

A sequence whose terms altern

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MC200401532: SADIA BATOOL

MTH202:Grand Quiz

Time Left 87 sec(s)

Quiz Start Time: 10:23 PM, 30 December 2020

Question # 9 of 30 (Start time: 10:28:15 PM, 30 December 2020)

Total Marks: 1

The total number of terms in an arithmetic series
0 + 5 + 10 + 15 + ... 50 are ____

Select the correct option

☐

9

☐

10

☒

11

☐

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Click to Save Answer & Move to Next Question

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Quiz List

Quiz

~(p ^ q) = ____ . MTH202 - Goc

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MC200401532: SADIA BATOOL

MTH202:Grand Quiz

Time Left 85 sec(s)

Quiz Start Time: 10:23 PM, 30 December 2020

Question # 10 of 30 (Start time: 10:28:24 PM, 30 December 2020)

Total Marks: 1

Cardinality means the total number of elements in a set.

Select the correct option

☐

False

☒

True

Click to Save Answer & Move to Next Question

Quiz List

Quiz

~(p ^ q) = ____ . MTH202 - Goc

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MC200401532: SADIA BATOOL

MTH202:Grand Quiz

Time Left 83 sec(s)

Quiz Start Time: 10:23 PM, 30 December 2020

Question # 11 of 30 (Start time: 10:28:33 PM, 30 December 2020)

Total Marks: 1

If A contains 3 elements and B contains 2 elements, then number of subsets of $A \times B$ are

Select the correct option

☐

64

☐

32

☐

12

☒

6

Click to Save Answer & Move to Next Question

Quiz List

Quiz

~(p ^ q) = ____ , MTH202 - Goc

A sequence whose terms alterna

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Apps W Introduction to Co... Introduction to Co... Excellence in Busine... Tables in Excel - Eas... Android Core Buildi... Multiple Choice Quiz Presearch ENG201 Solved Hel...

MC200401532: SADIA BATOOL

MTH202:Grand Quiz

Time Left 76 sec(s)

Quiz Start Time: 10:23 PM, 30 December 2020

Question # 12 of 30 (Start time: 10:28:47 PM, 30 December 2020)

Total Marks: 1

The contrapositive of the conditional statement 'If it is Sunday, then I go for shopping' is -----

Select the correct option

☐

I do Not go for shopping, then it is Not Sunday.

☐

I go for shopping, then it is Sunday.

☒

I do Not go for shopping, then it is Sunday.

☐

I go for shopping, then it is Not Sunday.

Click to Save Answer & Move to Next Question

Quiz List

Quiz

~(p ^ q) = ____ , MTH202 - Goc

A sequence whose terms alterna

+

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MC200401532: SADIA BATOOL

MTH202:Grand Quiz

Time Left 79 sec(s)

Quiz Start Time: 10:23 PM, 30 December 2020

Question # 13 of 30 (Start time: 10:29:07 PM, 30 December 2020)

Total Marks: 1

The set of the number less than 10 and more than 1 is _____.

Select the correct option

☒

Tabular Form

☐

Descriptive Form

☐

Set builder Form

☐

Both a and b

Click to Save Answer & Move to Next Question

MC200401532: SADIA BATOOL

MTH202:Grand Quiz

Time Left 84 sec(s)

Quiz Start Time: 10:23 PM, 30 December 2020

Question # 14 of 30 (Start time: 10:29:26 PM, 30 December 2020)

Total Marks: 1

The set of Natural numbers is the discrete set.

Select the correct option

☒

True

☐

False

Click to Save Answer & Move to Next Question

MC200401532: SADIA BATOOL

MTH202:Grand Quiz

Time Left 69 sec(s)

Quiz Start Time: 10:23 PM, 30 December 2020

Question # 14 of 30 (Start time: 10:29:26 PM, 30 December 2020)

Total Marks: 1

The set of Natural numbers is the discrete set.

Select the correct option

☐

True

☒

False

Click to Save Answer & Move to Next Question

Question # 15 of 30 (Start time: 10:30:44 PM, 30 December 2020) Total Marks: 1

An important data type in computer programming consists of _____

- Select the correct option
- ☐ Equations
 - ☐ Matrices
 - ☒ Graphs
 - ☐ finite sequences

Click to Save Answer & Move to Next Question

Question # 16 of 30 (Start time: 10:32:28 PM, 30 December 2020) Total Marks: 1

Elements of a set are listed in pair of brackets and separated by commas is _____

- Select the correct option
- ☒ Tabular Form
 - ☐ Descriptive Form
 - ☐ Set builder Form
 - ☐ Both a and b

Click to Save Answer & Move to Next Question

Question # 17 of 30 (Start time: 10:32:54 PM, 30 December 2020) Total Marks: 1

Cartesian product of two sets symbolically written as _____

- Select the correct option
- ☐ $A \times B = \{(a, b) | a \in A \text{ and } b \in B\}$
 - ☐ $A \times B = \{(a, b) | a \in A \text{ and } b \in B\}$
 - ☒ $A \times B = \{(a, b) | a \in A \text{ and } b \in B\}$
 - ☐ $A \times B = \{(a, b) | a \in A \text{ and } b \in B\}$

Click to Save Answer & Move to Next Question

Question # 18 of 30 (Start time: 10:34:12 PM, 30 December 2020) Total Marks: 1

A constant function is surjective if and only if.....

- Select the correct option
- ☐ The co domain consists of a single element
 - ☒ The domain consists of a single element.
 - ☐ The domain consists of more than one elements.
 - ☐ The co domain consists of more than one elements.

Click to Save Answer & Move to Next Question

[Click to Save Answer & Move to Next Question](#)

Question # 2 of 30 (Start time: 10:40:11 PM, 30 December 2020) Total Marks: 1

Which is not a binary operation on the set of natural numbers N ?

Select the correct option

- ☐ Addition
- ☐ Multiplication
- ☐ Subtraction
- ☐ None of these.

Waiting for quiz.vu.edu.pk...

Question # 2 of 30 (Start time: 10:40:11 PM, 30 December 2020) Total Marks: 1

Which is not a binary operation on the set of natural numbers N ?

Select the correct option

- ☐ Addition
- ☐ Multiplication
- ☒ Subtraction
- ☐ None of these.

Click to Save Answer & Move to Next Question

Quiz List

Quiz

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BC190206209: MAJID IFTIKHAR

MTH202:Grand Quiz

Time Left69 sec(s)

Quiz Start Time: 10:39 PM, 30 December 2020

Question # 5 of 30 (Start time: 10:40:54 PM, 30 December 2020)

Total Marks: 1

A function whose inverse function exists is called a/an _____.

Select the correct option

☐

injective

☐

surjective

☒

invertible

☐

symmetric

Click to Save Answer & Move to Next Question

Quiz List

Quiz

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BC190206209: MAJID IFTIKHAR

MTH202:Grand Quiz

Time Left84 sec(s)

Quiz Start Time: 10:39 PM, 30 December 2020

Question # 6 of 30 (Start time: 10:41:19 PM, 30 December 2020)

Total Marks: 1

If $f(x) = 2x$ and $g(x) = x^2$ then $f(g(x))$ is

Select the correct option

☐

$2x^2$

☐

x^3

☒

$2x^3$

☐

2

Reload Math Equations

Quiz List

Quiz

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MTH202:Grand Quiz

Quiz Start Time: 10:39 PM, 30 December 2020

Question # 7 of 30 (Start time: 10:41:32 PM, 30 December 2020)

Total Marks: 1

Let $f(x) = 2x$ and $g(x) = x + 2$ define functions f and g from R to R , then $(f - g)(x)$ is ____.

Select the correct option

Reload Math Equations

☐

$x - 2$

☒

$2x + 2$

☐

$3x + 2$

☐

$2x^2 + 4x$

Click to Save Answer & Move to Next Question

Quiz List

Quiz

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BC190206209: MAJID IFTIKHAR

MTH202:Grand Quiz

Time Left 90 sec(s)

Quiz Start Time: 10:39 PM, 30 December 2020

Question # 11 of 30 (Start time: 10:42:20 PM, 30 December 2020)

Total Marks: 1

Let $f(2) = 3, g(2) = 3, f(4) = 1$ and $g(4) = 2$ then the value of $f \circ g(4)$ is

Select the correct option

Reload Math Equations

☐

\$1\$

☐

\$2\$

☐

\$3\$

☐

\$4\$

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Quiz List

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MTH202:Grand Quiz

Quiz Start Time: 10:39 PM, 30 December 2020

Question # 11 of 30 (Start time: 10:42:20 PM, 30 December 2020)

Total Marks: 1

Let $f(2) = 3$, $g(2) = 3$, $f(4) = 1$ and $g(4) = 2$ then the value of $f \circ g(4)$ is

Select the correct option

Reload Math Equations

☒	1
☐	2
☐	3
☐	4

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Windows taskbar with icons for Mail, File Explorer, Chrome, Word, etc.

Quiz List

Quiz

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BC190206209: MAJID IFTIKHAR

MTH202:Grand Quiz

Time Left 78 sec(s)

Quiz Start Time: 10:39 PM, 30 December 2020

Question # 12 of 30 (Start time: 10:42:28 PM, 30 December 2020)

Total Marks: 1

Let $p \rightarrow q$ be a conditional statement, then the statement $q \rightarrow p$ is called

Select the correct option

☐	Inverse
☒	Converse
☐	Contrapositive
☐	Double conditional

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Quiz List

Quiz

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BC190206209: MAJID IFTIKHAR

MTH202:Grand Quiz

Time Left83 sec(s)

Quiz Start Time: 10:39 PM, 30 December 2020

Question # 13 of 30 (Start time: 10:42:42 PM, 30 December 2020)

Total Marks: 1

Let p1, p2, p3 be True premises in a given Truth Table. If the conjunctions of the Conclusion with each of p1, p2, p3 are True, then the argument is

Select the correct option

☐

False

☐

True

☐

Invalid☒

Click to Save Answer & Move to Next Question

Windows

Quiz List

Quiz

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BC190206209: MAJID IFTIKHAR

MTH202:Grand Quiz

Time Left54 sec(s)

Quiz Start Time: 10:39 PM, 30 December 2020

Question # 14 of 30 (Start time: 10:42:54 PM, 30 December 2020)

Total Marks: 1

Complementary Relation symbolically written as

Select the correct option

☒

$$R = A \times B \cdot R = \{(a,b) \in A \times B \mid (a,b) \in R\}$$
☐

Click to Save Answer & Move to Next Question

Windows

Quiz List x Quiz x

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BC190206209: MAJID IFTIKHAR

MTH202:Grand Quiz

Time Left 49 sec(s)

Quiz Start Time: 10:39 PM, 30 December 2020

Question # 15 of 30 (Start time: 10:43:35 PM, 30 December 2020) Total Marks: 1

If $x \equiv 17 \pmod{5}$ Which of the following integers are valid solution for x ?

Select the correct option

☐ -44

☒ 4

☐ 8

☐ 12

Click to Save Answer & Move to Next Question

Quiz List x Quiz x

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BC190206209: MAJID IFTIKHAR

MTH202:Grand Quiz

Time Left 85 sec(s)

Quiz Start Time: 10:39 PM, 30 December 2020

Question # 16 of 30 (Start time: 10:44:28 PM, 30 December 2020) Total Marks: 1

A graph of a function f is one to one iff every horizontal line intersects the graph in at most one point.

Select the correct option

☒ True

☐ False

Click to Save Answer & Move to Next Question

Quiz List

Quiz

quiz.vu.edu.pk/QuizQuestion.aspx?ver=6e9818fc-ec53-4c24-88b7-df7e7ce2b7cb

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BC190206209: MAJID IFTIKHAR

MTH202:Grand Quiz

Time Left87sec(s)

Quiz Start Time: 10:39 PM, 30 December 2020

Question # 17 of 30 (Start time: 10:44:40 PM, 30 December 2020)

Total Marks: 1

Y+ 7 =10 is a proposition?

Select the correct option

☐

True

☐

False

Click to Save Answer & Move to Next Question

Quiz List

Quiz

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sec(s)

Quiz Start Time: 10:39 PM, 30 December 2020

Question # 21 of 30 (Start time: 10:45:28 PM, 30 December 2020)

Total Marks: 1

If $A=\{1, 2, 3\}$ is a set and $R = \{(1, 2), (2, 2), (2, 1)\}$ is a relation on A. R is

Select the correct option

☐

Transitive

☒

Symmetric

☐

Reflexive

☐

None of these

Reload Math Equations

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Quiz List

Quiz

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BC190206209: MAJID IFTIKHAR

MTH202:Grand Quiz

Time Left84 sec(s)

Quiz Start Time: 10:39 PM, 30 December 2020

Question # 22 of 30 (Start time: 10:45:50 PM, 30 December 2020)

Total Marks: 1

Let $A=\{1, 2, 3, 4\}$ and $R=\{(1, 1)(2, 2)(3, 3)(4, 4)\}$ then R is

Select the correct option

Reload Math Equations

☐

Transitive

☐

Symmetric

☐

Reflexive

☒

Options a,b,and c all true

Quiz List

Quiz

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MTH202:Grand Quiz

Quiz Start Time: 10:49 PM, 30 December 2020

Question # 5 of 30 (Start time: 10:50:38 PM, 30 December 2020)

Total Marks: 1

Which of the following is a conditional statement?

Select the correct option

Reload Math Equations

☐

 $p \wedge q$

☒

 $p \rightarrow q$

☐

 $p \oplus q$

☐

 $p \vee q$

Click to Save Answer & Move to Next Question

Quiz List

Quiz

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MTH202:Grand Quiz

Quiz Start Time: 10:49 PM, 30 December 2020

Question # 5 of 30 (Start time: 10:50:38 PM, 30 December 2020)

Total Marks: 1

Which of the following is a conditional statement?

Select the correct option

Reload Math Equations

☐

 $p \wedge q$

☒

 $p \rightarrow q$

☐

 $p \oplus q$

☐

 $p \vee q$

Click to Save Answer & Move to Next Question

Quiz List

Quiz

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BC200201669: NAZISH BIBI

MTH202:Grand Quiz

Time Left86sec(s)

Quiz Start Time: 10:49 PM, 30 December 2020

Question # 6 of 30 (Start time: 10:51:06 PM, 30 December 2020)

Total Marks: 1

Let $f: R \rightarrow R$ is a one to one function then c, f is also one to one function for

Select the correct option

Reload Math Equations

☐

$c \neq 0$

☐

$c = 0$

Click to Save Answer & Move to Next Question

Quiz List

Quiz

The converse of the condition: x

MTH202 - Discrete Mathemat: x

distributive law - Google Sear: x

quiz.vu.edu.pk/QuizQuestion.aspx?ver=87c3a2de-25cb-4a48-b26e-1f097f08a163

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BC200201669: NAZISH BIBI

MTH202:Grand Quiz

Time Left27sec(s)

Quiz Start Time: 10:49 PM, 30 December 2020

Question # 19 of 30 (Start time: 10:55:18 PM, 30 December 2020)

Total Marks: 1

The converse of the conditional statement 'If I live in Lahore, then I live in Punjab' is

Select the correct option

☐

If I do Not live in Lahore, then I live in Punjab.

☐

If I do Not live in Lahore, then I do Not live in Punjab.

☐

If I live in Punjab, then I do Not live in Lahore.

☒

If I live in Punjab, then I live in Lahore.

Click to Save Answer & Move to Next Question

Quiz List

Quiz

A function whose rang

The converse of the co

MTH202 - Discrete Ma

distributive law - Goo

←→↻🏠🔒quiz.vu.edu.pk/QuizQuestion.aspx?ver=81f36b7a-d79a-40f8-910a-2bdf14a27dd1

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BC200201669: NAZISH BIBI

MTH202:Grand Quiz

Time Left59sec(s)

Quiz Start Time: 10:49 PM, 30 December 2020

Question # 20 of 30 (Start time: 10:56:33 PM, 30 December 2020)

Total Marks: 1

A function whose range consists of only one element is called.....

Select the correct option

☐

Constant function

☐

Onto function

☒

One to one function☐

Click to Save Answer & Move to Next Question

Quiz List

Quiz

A function whose rang

The converse of the co

MTH202 - Discrete Ma

distributive law - Goo

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BC200201669: NAZISH BIBI

MTH202:Grand Quiz

Time Left76sec(s)

Quiz Start Time: 10:49 PM, 30 December 2020

Question # 21 of 30 (Start time: 10:57:21 PM, 30 December 2020)

Total Marks: 1

The common ratio of the following geometric sequence
4,12,36,108.....
is _____

Select the correct option

☐

2

☒

3☐☐

Click to Save Answer & Move to Next Question

Quiz List

Quiz

A function whose rang

The converse of the co

MTH202 - Discrete Ma

distributive law - Goo

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BC200201669: NAZISH BIBI

MTH202:Grand Quiz

Time Left76sec(s)

Quiz Start Time: 10:49 PM, 30 December 2020

Question # 21 of 30 (Start time: 10:57:21 PM, 30 December 2020)

Total Marks: 1

The common ratio of the following geometric sequence
4,12,36,108.....
is _____

Select the correct option

☐

2

☒

3☐☐

Click to Save Answer & Move to Next Question