MTH-100 Important Notes For Final Term !! Solve By Vu-Topper RM!!

Question No:1 (Marks:2-5) Vu-Topper RM

Define a set?

Definition:

A set is an unordered collection of distinct objects. Objects in the collection are called elements of the set.

Question No:2 (Marks:2-5) Vu-Topper RM

What is roster method of sets?

The roster method of specifying a set consists of surrounding the collection of elements with braces. For example, the set of counting numbers from 1 to 5 would be written as {1, 2, 3, 4, 5}.

Question No:3 (Marks:2-5) Vu-Topper RM

Define null set?

Definition:

The set with no elements is called the empty set or the null set.

Question No:4 (Marks:2-5) Vu-Topper RM

Define universal set?

Definition:

The universal set is the set of all things pertinent to a given discussion and is designated by the symbol U

Question No:5 (Marks:2-5) Vu-Topper RM

Define subset?

Definition:

The set A is a subset of the set B, denoted A B, if every element of A is an element of B.

Question No:6 (Marks:2-5) Vu-Topper RM

Define equal set?

Definition:

Two sets A and B are equal if A B and B A. If two sets A

and B are equal, we write A = B to designate that relationship.

Question No:7 (Marks:2-5) Vu-Topper RM

Define intersection of sets?

Definition:

The intersection of two sets A and B is the set containing those elements which are elements of A and elements of B. We write A B to denote an Intersection B. Example: If A = {3, 4, 6, 8} and B = {1, 2, 3, 5, 6} then A B = {3, 6}

Question No:8 (Marks:2-5) Vu-Topper RM

Define union of sets?

Definition:

The union of two sets A and B is the set containing those elements which are elements of
A or elements of B. We write A B to denote A Union B. Example: If A = {3, 4, 6} and B = { 1, 2, 3, 5, 6} then A B = {1, 2, 3, 4, 5, 6}.

Question No:9 (Marks:2-5) Vu-Topper RM

What are algebraic properties of sets? Or difference between commutative associative and distributive law?

Commutative:

Union and intersection are commutative operations. In other words, A B = B A and A ∩ B = B ∩ A

Associative:

Union and intersection are associative operations. In other words, (A B) C = A (B C) and (A ∩ B) ∩ C = B ∩ (A ∩ C)

Distributive:

Union and Intersection are distributive with respect to each other. In other words, A
∩ (B C)= (A ∩ B) (A ∩ C) and A (B ∩ C)= (A B) ∩ (A C)

Question No:10 (Marks:2-5) Vu-Topper RM

Define cardinality? With two types?

Definition:

Cardinality refers to the number of elements in a set
A finite set has a countable number of elements
An infinite set has at least as many elements as the set of natural numbers

Question No:11 (Marks:2-5) Vu-Topper RM

Define complex number?

Definition:

Numbers of the form a + bi are called complex numbers. a is the real part and b is the imaginary part. The set of complex numbers is denoted by C

Question No:12 (Marks:2-5) Vu-Topper RM

Define absolute value?

Definition:

The absolute value or modulus of a complex number is the distance the complex number is from the origin on the complex plane.

Question No:13 (Marks:2-5) Vu-Topper RM

Define relation?

Definition:

A mapping between two sets A and B is simply a rule for relating elements of one set to the other. A mapping is also called a relation.

Question No:14 (Marks:2-5) Vu-Topper RM

Define domain and range?

Definition:

The set consisting of members of the pre-image or inputs of a function is called its domain. For a given domain the set of possible outcomes or images of a function is called its range.

Question No:15 (Marks:2-5) Vu-Topper RM

Define even and odd function?

Definition:

A function is called an even function if its graph is symmetric with respect to the vertical axis, and it is called an odd function if its graph is symmetric with respect to the origin.

Question No:16 (Marks:2-5) Vu-Topper RM

Define quadratic function?

Definition:

A function of the type y = ax2 + bx + c where a, b, and c are called the coefficients, is called a quadratic function.

Question No:17 (Marks:2-5) Vu-Topper RM

Define a matrix?

Definition:

A matrix is a rectangular arrangement of numbers in rows and columns. The order of a matrix is the number of the rows and columns. The entries are the numbers in the matrix.

Question No:18 (Marks:2-5) Vu-Topper RM

Define identity matrix?

Definition:

A Square matrix with ones on the diagonal and zeros elsewhere is called an identity matrix. It is denoted by I.

Question No:19 (Marks:2-5) Vu-Topper RM

When a matrix has echelon form?

A matrix is in echelon form if it has the following properties Every non-zero row begins with a 1 (called a leading

1) Every leading one in a lower row is further to the right of the leading one above it. If there are zero rows, they are at the end of the matrix

Question No:20 (Marks:2-5) Vu-Topper RM

When a matrix has refused echelon form?

A matrix is in reduced echelon form if in addition to the above three properties it als o has the following property:
Every other entry in a column containing a leading one is zero Methods for finding Solutions of Equations:
Using Row Operations: Recall that when we are solving simultaneous equations, the system of equations remains unchanged if we perform the following operations:
Multiply an equation by a non-zero constants Add a multiple of one equation to another equation Interchange two equations.

Question No:21 (Marks:2-5) Vu-Topper RM

Define adjoin or adjugated?

Definition:

Given a matrix A, calculate all the cofactors of A. We then form the matrix (of the cofactors. The Adjoint or Adjugated of A is the transpose of the matrix of the cofactors.

Question No:22 (Marks:2-5) Vu-Topper RM

Define sequence and terms?

Definition:

Rows of numbers are called sequences, and the separate numbers are called terms of the sequence.

Question No:23 (Marks:2-5) Vu-Topper RM

Define arithmetic sequences?

Definition:

An Arithmetic Sequence (or Arithmetic Progression) is a sequence in which each term after the first term is found by adding a constant, called the common difference (d), to the previous term

Question No:24 (Marks:2-5) Vu-Topper RM

Define geometric sequences?

Definition:

A sequence in which each term after the first is found by multiplying the previous term by a constant value called the common ratio, is called a Geometric Sequence (or Geometric Progression). The formula for finding any term of a geometric sequence is an = arn-1

Question No:25 (Marks:2-5) Vu-Topper RM

Define geometrics series?

Definition**:**

A Geometric Series is the sum of the terms in a arithmetic sequence. The formula for fining the sum of the first n terms of a geometric sequence is given by Sn=a(1-rn)/1-

Question No:26 (Marks:2-5) Vu-Topper RM

Define convergent and divergent?

Definition:

If a sequence of numbers approaches (or converges) to a finite number, we say that the sequence is convergent. If a sequence does not converge to a finite number, it is called divergent.

Question No:27 (Marks:2-5) Vu-Topper RM

What is multiplication principal?

Multiplication Principle:

If two operations A and B are performed in order, with n possible outcomes for A and possible outcomes for B, then there are n x m possible combined outcomes of the first operation followed by the second.

Question No:28 (Marks:2-5) Vu-Topper RM

Describe Pascal's Triangle?

Expression= Coefficients

(x + y)1 = x + y= 1 1

$(x + y)2 = x2 + 2xy + y=21\ 2\ 1$
$(x + y)3 = x3 + 3x2y + 3xy2 + y3= 1\ 3\ 3\ 1$
$(x + y)4 = x4 + 4x3y + 6x2y2 + 4xy3 + y=4\ 1\ 4\ 6\ 4\ 1$
$(x + y)5 = x5 + 5x4y + 10x3y2 + 10x2y3 + 5xy4 + y5 =1\ 5\ 10\ 10\ 5\ 1$

Question No:29 (Marks:2-5) Vu-Topper RM

What are Properties of Gradient?

The bigger the gradient's magnitude is, the steeper the line segment.
Negative gradient means line is facing downwards.
Positive gradient means the line is facing upwards.
The slope gives the average rate of change in y per unit change in x, where the value of y depends on x.
Two-line segments that are parallel will have the same slope.

Question No:30 (Marks:2-5) Vu-Topper RM

What are Properties of the Cosine Function?

The cosine function has "period" 360*o* as it repeats itself after each revolution of 360*o* Cos (-) = Cos as the x-coordinate of P doesn't change when we reflect across the x-axis.
Cos (180 -) = - Cos as the x-coordinate changes signs when reflected across the y-axis. Cos (- 180) = - Cos as the x-coordinate changes signs when reflected across the origin.
Cos is positive in the first and the fourth quadrant (as the x coordinate of P is positive), and negative in the second and the third quadrant as the x-axis is negative there.
The range of the cosine function is between -1 and 1. The maximum value of 1 is taken when = 0*o*, ±360*o*, ±720*o*, …, and the minimum value of -1 is at = ±180*o*, ±540*o*, …,

Question No:31 (Marks:2-5) Vu-Topper RM

Define periodic function and period?

The functions with the property that they keep repeating themselves are called periodic functions. The smallest interval

for which the function repeats itself is called its period.

Question No:32 (Marks:2-5) Vu-Topper RM

What are Properties of the Sine Function?

Sin (-) = -Sin as the y-coordinate of P changes sign when we reflect across the x-axis.

Sin is positive in the first and the second quadrant (as the y coordinate of P is positive), and negative in the third and the fourth quadrant as the y coordinate is negative there.

Sin (180 -) = Sin because as we reflect across the y-axis the y-coordinate doesn't change.

Sin (- 180) = - Sin as the y-coordinate changes signs when reflected across the origin.

Like the cosine function, the sine function is also periodic, with period 360 degrees, and range between -1 and 1.

Question No:33 (Marks:2-5) Vu-Topper RM

What are Properties of the Tangent Function?

Tan (-) = -Tan as the y-coordinate of P changes sign when we reflect across the x-axis but the coordinate doesn't change sign.

Tan is positive in the first and the third quadrant (as the x and y coordinates of P have the same signs in these quadrants), and negative in the second and the fourth quadrant as the x and y coordinates have opposite signs in these quadrants.

Tan(180 -) = -Tan as the x-coordinate of P changes sign when we reflect across the y-axis but the coordinate doesn't change sign

The domain of tan does **not** include the angles for which x is 0, namely, for = ±90, ±270, …

Like the cosine and sine functions, the tangent function is also periodic, but its period is 180. i.e. tan(

+ 180) = tan and tan(- 180) = tan

Question No:34 (Marks:2-5) Vu-Topper RM

Define amplitude?

Definition:

The Amplitude of a function is the height from the mean (or the rest) value of the function to its maximum or minimum value.

Question No:35 (Marks:2-5) Vu-Topper RM

Define inverse sin function?

Definition:

The inverse sine function is defined by y = arcsine x if and only if sin y = x. The domain of y = arcsine x is [–1, 1]. The range of y = arcsine x is [–/ , /2].

Question No:36 (Marks:2-5) Vu-Topper RM

Define inverse cosign function?

Definition:

The inverse cosine function is defined by y = arcus if and only if cos y = x. The domain of y = arcus x is [–1, 1]. The range of y = arcus x is [0,].

Question No:37 (Marks:2-5) Vu-Topper RM

Define inverse tangent function?

Definition:

The inverse tangent function is defined by y = arctan x if and only if tan y = x. The domain of y = arctan x is . The range of y = arctan x is [–/2, /2].

Question No:38 (Marks:2-5) Vu-Topper RM

Define identity and conditional equation?

Definition: T

wo functions f and g are said to be identically equal if f(x) = g(x) for every value of x for which both functions are defined. Such an equation is referred to as an identity. An equation that is not an identity is called a conditional equation.

Question No:39 (Marks:2-5) Vu-Topper RM

Define statistics?

Definition:

Methods of collection, organization and analysis of numerical information are collectively called statistics.

Define variable and data?

Pieces of numerical and non-numerical information are called data. In order to collect data, you need to observe or measure some property; this property is called a variable.

Question No:40 (Marks:2-5) Vu-Topper RM

Define quantitative and qualitative variables?

Definition:

A variable is qualitative if it is not possible for it to take a numerical value. A variable is quantitative if it can take a numerical value. A quantitative variable which can take any value in a given range is called a continuous variable. A quantitative variable which has clear steps between its possible values is called a discrete variable.

Question No:41 (Marks:2-5) Vu-Topper RM

Define Descriptive Statistics?

Comprises those methods concerned with collection and describing a set of data so as to yield meaningful information is called descriptive statistics.

Question No:42 (Marks:2-5) Vu-Topper RM

Define inferential statistics?

Inferential Statistics:

Comprises those methods concerned with analysis of a subset of data leading to predictions or inferences about the entire set of data.

Question No:43 (Marks:2-5) Vu-Topper RM

Define population?

Definitions: **A populati on** is defined as the set of all possible members of a stated group. A cross-section of the returns of all of the stocks traded on the New York Stock Exchange (NYSE) is an example of a population.

Question No:44 (Marks:2-5) Vu-Topper RM

Define sample?

Definition**:**

A sample is defined as a subset of the population of interest. Once a population has been defined, a sample can be drawn from the population, and the sample's characteristics can be used to describe the population as a whole.

Question No:45 (Marks:2-5) Vu-Topper RM

Define perimeter?

Definition:

A measure used to describe a characteristic of a population is referred to as a parameter.

Question No:46 (Marks:2-5) Vu-Topper RM

What is Nominal scale?

Observations are classified or counted with no particular order. It consists of assigning items to groups or categories. No quantitative information is conveyed and no ordering of the items is implied. Nominal scales are therefore qualitative rather than quantitative.

Religious preference, race, and gender are all examples of nominal scales.

Question No:47 (Marks:2-5) Vu-Topper RM

What is Ordinal scale?

All observations are placed into separate categories and the categories are placed in order with respect to some characteristic. Differences between values makes no sense.
Political parties on left to right spectrum given labels 0, 1, 2; restaurant ratings, etc, are examples of ordinal scales.

Question No:48 (Marks:2-5) Vu-Topper RM

Define Interval scale?

This scale provides ranking and assurance that differences between scale values are equal.
Difference makes sense, but ratio doesn't; and there is no natural zero.
temperature (C, F) and dates are examples of interval scale

Question No:49 (Marks:2-5) Vu-Topper RM

What is Ratio scale?

These represent the strongest level of measurement. In addition to providing ranking and equal differences between scale values, ratio scales have a true zero point as the origin.
Height, weight, age and length are all examples of ratio scale.

Question No:50 (Marks:2-5) Vu-Topper RM

What is frequency distribution?

Definition:

A frequency distribution is a tabular presentation of statistical data that aids the analysis of large data sets. Frequency distributions summarize statistical data by assigning it to specified groups, or intervals.

Question No:51 (Marks:2-5) Vu-Topper RM

Define relative distribution?

Definition:

Relative frequency is calculated by dividing the frequency of

each interval by the total number of observations. Simply, relative frequency is the percentage of total observations falling within each interval.

Question No:52 (Marks:2-5) Vu-Topper RM

Define cumulative frequency?

Definition**:**

Cumulative Frequency is calculated by summing the frequencies starting at the lowest interval and progressing through the highest. Cumulative frequency for any given interval is the sum of the frequencies up to and including the given interval.

Question No:53 (Marks:2-5) Vu-Topper RM

What is bar chart?

Definition: A **Bar chart** graphically represents the data sets by representing the frequencies as heights of bars.

Question No:54 (Marks:2-5) Vu-Topper RM

What is histogram?

Definition:

A Bar chart which represents continuous data is called a histogram if

The bars have no spaces between them (though there may be bars with zero height, which could look like spaces).

The area of each bar is proportional to the frequency.

If all the bars have the same width, then the height is proportional to the frequency.

Question No:55 (Marks:2-5) Vu-Topper RM

Define frequency density?

Definition:

Frequency Density is defined as the ratio between the frequency of a class and the class width. i.e., Frequency Density = Frequency/Class Width

Question No:56 (Marks:2-5) Vu-Topper RM

Define arithmetic mean?

Definition:

The Arithmetic Mean is the sum of the observation values divided by the number of observations. It is the most widely used measure of central tendency, and is the only measure where the sum of the deviations of each value from the mean is always zero. The formula for calculating the arithmetic mean of n values is: 1 n i i X X n □ □ □

Question No:57 (Marks:2-5) Vu-Topper RM

Define probability space?

Definition:

A Probability Space or Sample Space is the set of all the possible outcomes in an experiment

Question No:58 (Marks:2-5) Vu-Topper RM

What are Characteristics of a Probability Distribution?

The probability of any event A lies between 0 and 1, i.e. 0()PA The sum of probabilities of all the mutually exclusive and exhaustive events in a probability distribution equals 1.