

MCQS

STA641 midterm preparation file

ZB

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

In the name of God , Most
Gracious, Most merciful



Sta641

MCQS

1. Which of the following is a measure of central tendency? a) Variance

b) Mean

c) Range

d) Standard deviation

Answer: b) Mean

2. Which probability distribution is used to model the number of successes in a fixed number of independent Bernoulli trials? a) Normal distribution

b) Poisson distribution

c) Binomial distribution

d) Exponential distribution

Answer: c) Binomial distribution

3. In hypothesis testing, what is the null hypothesis typically denoted as? a) H_1

b) H_0

c) H_a

d) H_r

Answer: b) H_0

4. What is the range of correlation coefficient values? a) -1 to 0

b) 0 to 1

c) -1 to 1

d) $-\infty$ to $+\infty$

Answer: c) -1 to 1

5. What type of error occurs when a false null hypothesis is not rejected? a) Type I error

- b) Type II error
- c) Sampling error
- d) Random error

Answer: b) Type II error

6. Which test is used to determine if there is a significant difference between the means of two independent groups? a) Paired t-test

- b) One-way ANOVA
- c) Two-sample t-test
- d) Chi-square test

Answer: c) Two-sample t-test

7. The standard deviation is the square root of which of the following? a) Variance

- b) Covariance
- c) Mean
- d) Range

Answer: a) Variance

8. Which of the following distributions is used to model the time between events in a Poisson process? a)

Exponential distribution

- b) Normal distribution
- c) Binomial distribution
- d) Poisson distribution

Answer: a) Exponential distribution

9. Which type of regression is used when the dependent variable is categorical? a) Linear regression

b) Logistic regression

c) Polynomial regression

d) Ridge regression

Answer: b) Logistic regression

10. In a normal distribution, what percentage of the data lies within one standard deviation from the mean? a) 50%

b) 68%

c) 95%

d) 99%

Answer: b) 68%

11. Which of the following is a characteristic of a probability density function (PDF)? a) It can take negative values.

b) The total area under the curve equals 1.

c) It is always increasing.

d) It is always decreasing.

Answer: b) The total area under the curve equals 1.

12. What is the purpose of the p-value in hypothesis testing? a) To measure the effect size

b) To measure the sample size

c) To determine the strength of evidence against the null hypothesis

d) To calculate the confidence interval

Answer: c) To determine the strength of evidence against the null hypothesis

13. Which of the following tests is used to compare the variances of two populations? a) F-test

- b) t-test
- c) Z-test
- d) Chi-square test

Answer: a) F-test

14. What type of variable is measured on an interval scale? a) Nominal

- b) Ordinal
- c) Interval
- d) Ratio

Answer: c) Interval

15. In regression analysis, what does the coefficient of determination (R^2) represent? a) The average value of the dependent variable

- b) The proportion of variance in the dependent variable explained by the model
- c) The residuals in the model
- d) The slope of the regression line

Answer: b) The proportion of variance in the dependent variable explained by the model

16. What does a confidence interval represent? a) The exact value of the population parameter

- b) The range of values in which a sample statistic will fall
- c) The range of values that is likely to contain the population parameter with a certain level of confidence
- d) The range of values that the sample statistic could take

Answer: c) The range of values that is likely to contain the population parameter with a certain level of confidence

17. What is the main purpose of ANOVA? a) To compare means between two groups
b) To test the relationship between two variables
c) To compare means between three or more groups
d) To test the normality of data

Answer: c) To compare means between three or more groups

18. Which assumption is made when performing a one-sample t-test? a) The population is normally distributed.
b) The data are binomial.
c) The sample size is greater than 30.
d) The population variance is known.

Answer: a) The population is normally distributed.

19. In a hypothesis test, what is the significance level (alpha) typically set to? a) 0.01
b) 0.05
c) 0.10
d) 0.20

Answer: b) 0.05

20. What does the term "power" in statistical testing refer to? a) The probability of rejecting the null hypothesis when it is true
b) The probability of rejecting the null hypothesis when it is false
c) The probability of accepting the null hypothesis when it is false
d) The probability of accepting the null hypothesis when it is true

Answer: b) The probability of rejecting the null hypothesis when it is false

21. Which of the following methods is used to detect multicollinearity in regression analysis?
- a) Durbin-Watson test
 - b) Variance Inflation Factor (VIF)
 - c) Chi-square test
 - d) Kruskal-Wallis test

Answer: b) Variance Inflation Factor (VIF)

22. Which of the following is true for a sample from a normal distribution?
- a) The sample mean is always equal to the population mean.
 - b) The sample mean is normally distributed for large samples.
 - c) The sample mean is always greater than the population mean.
 - d) The sample variance is always greater than the population variance.

Answer: b) The sample mean is normally distributed for large samples.

23. Which of the following is an assumption of the linear regression model?
- a) The dependent variable is categorical.
 - b) The errors are independent and identically distributed.
 - c) The independent variables are not related to each other.
 - d) The residuals are not normally distributed.

Answer: b) The errors are independent and identically distributed.

24. What is the chi-square distribution used for?
- a) Testing means
 - b) Testing variances
 - c) Testing relationships between categorical variables
 - d) Estimating population parameters

Answer: c) Testing relationships between categorical variables

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25. What type of correlation exists when an increase in one variable is associated with a decrease in another? a) Positive correlation

b) Negative correlation

c) Zero correlation

d) No correlation

Answer: b) Negative correlation

26. What is the purpose of a scatter plot? a) To show the distribution of a single variable

b) To compare the means of two variables

c) To display the relationship between two variables

d) To test the hypothesis of a relationship

Answer: c) To display the relationship between two variables

27. Which of the following is a non-parametric test? a) t-test

b) ANOVA

c) Mann-Whitney U test

d) Linear regression

Answer: c) Mann-Whitney U test

28. In a simple linear regression, what is the slope of the regression line? a) The intercept

b) The correlation coefficient

c) The ratio of change in dependent variable per unit change in independent variable

d) The coefficient of determination

Answer: c) The ratio of change in dependent variable per unit change in independent variable

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29. Which of the following is a key assumption of the simple linear regression model? a) The relationship between the dependent and independent variables is non-linear.

b) There is homoscedasticity of residuals.

c) The data are non-normal.

d) The residuals are not independent.

Answer: b) There is homoscedasticity of residuals.

30. Which test is used to compare the means of more than two groups? a) t-test

b) Z-test

c) ANOVA

d) Chi-square test

Answer: c) ANOVA

31. In a two-tailed test, which of the following is the critical region for a significance level of 0.05? a) The 5% of the left tail

b) The 2.5% of each tail

c) The 5% of the right tail

d) The 1% of each tail

Answer: b) The 2.5% of each tail

32. Which of the following is true for a normally distributed variable? a) The mean, median, and mode are different.

b) The distribution is symmetric around the mean.

c) The mean is always greater than the median.

d) The mode is always equal to the median.

Answer: b) The distribution is symmetric around the mean.

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33. Which of the following is an example of a continuous random variable? a)

- Number of heads in a coin toss**
- b) Number of students in a class**
- c) Height of a person**
- d) Number of cars in a parking lot**

Answer: c) Height of a person

34. Which of the following is the appropriate test for comparing two population proportions? a) Paired t-test

- b) Independent t-test**
- c) Z-test for two proportions**
- d) Chi-square test**

Answer: c) Z-test for two proportions

35. Which measure of central tendency is best used for skewed data? a)

- Mean**
- b) Median**
- c) Mode**
- d) Variance**

Answer: b) Median

36. The F-distribution is used primarily in which type of analysis? a) Testing proportions

- b) Testing variance ratios**
- c) Testing means**
- d) Regression analysis**

Answer: b) Testing variance ratios

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37. Which of the following is true for a Type I error? a) It occurs when a true null hypothesis is rejected.
b) It occurs when a false null hypothesis is not rejected.
c) It is also known as a false positive.
d) It is related to the power of the test.

Answer: a) It occurs when a true null hypothesis is rejected.

38. Which of the following tests can be used to assess the goodness of fit of a model to data? a) t-test
b) ANOVA
c) Chi-square test
d) Z-test

Answer: c) Chi-square test

39. Which of the following is an example of a parametric test? a) Mann-Whitney U test
b) Wilcoxon signed-rank test
c) One-way ANOVA
d) Kruskal-Wallis test

Answer: c) One-way ANOVA

40. What does a p-value of 0.03 indicate in hypothesis testing? a) There is strong evidence against the null hypothesis.
b) There is strong evidence in favor of the null hypothesis.
c) There is weak evidence against the null hypothesis.
d) The test was not performed correctly.

Answer: a) There is strong evidence against the null hypothesis.

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41. Which of the following is a property of the Poisson distribution? a) It is used for continuous data.

b) It models the number of successes in a fixed number of trials.

c) It is used to model the time between events in a Poisson process.

d) It is symmetric and bell-shaped.

Answer: c) It is used to model the time between events in a Poisson process.

42. What does a confidence level of 95% mean? a) There is a 95% chance the sample mean is correct.

b) There is a 95% probability the population mean lies within the interval.

c) The population mean is always within the interval.

d) There is a 5% chance the population mean is outside the interval.

Answer: b) There is a 95% probability the population mean lies within the interval.

43. Which of the following is true about the standard error of the mean (SEM)? a) SEM decreases as the sample size increases.

b) SEM increases as the sample size increases.

c) SEM is the same as the standard deviation.

d) SEM is unaffected by the sample size.

Answer: a) SEM decreases as the sample size increases.

44. What is the null hypothesis in a chi-square goodness-of-fit test? a) The data follows a specified distribution.

b) The population means are equal.

c) The variances are equal.

d) The correlation between two variables is zero.

Answer: a) The data follows a specified distribution.

45. In linear regression, which of the following is used to check if the assumptions of the model are met? a) Box plot
b) Residual plot
c) Histogram of errors
d) Frequency distribution

Answer: b) Residual plot

46. Which of the following is true about a t-distribution? a) It is used when the sample size is large.
b) It has heavier tails than the normal distribution.
c) It is symmetric and has a mean of zero.
d) It is used for categorical data.

Answer: b) It has heavier tails than the normal distribution.

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Passing criteria of this course

Letter Grade	Grade Points	Equivalent Percentage
A+	4.00	90-100
A	4.00	85-89
A-	3.66 - 3.99	80-84
B+	3.33 - 3.65	75-79
B	3.00 - 3.32	71-74
B-	2.66 - 2.99	68-70
C	2.00 - 2.65	61-67
D	1.00 - 1.99	50-60
F	0.00	00-49

Passing Criteria for a Course:

The passing criteria is defined in such a way that it ensures the student shall be consistent in his studies throughout the semester.

Therefore, for passing a course/subject, student shall fulfill the following:

- a) Secure minimum **20%** score in Formative Assessments/Mid terms
- b) Secure minimum **20%** score in Final Term Examinations.
- c) Secure at least **40%** marks in aggregate while fulfilling the above requirements

Course Selection and Credit Hours

Q: How do I select courses when the course selection is open?

A: Follow these steps:

- 1. Check the credit hours allowed by your university (e.g., 21, 18, or 15 credit hours).**
- 2. Each subject typically has 3 credit hours.**
- 3. Divide the total allowed credit hours by 3 to determine how many subjects you can select.**

Examples:

21 credit hours = 7 subjects

15 credit hours = 5 subjects

Remember, the university may allow different credit hours for each student, so check your specific allowance.

By following these steps, you can make informed decisions during course selection and manage your credit hours effectively.

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Advice

Hmaesha relax ho ke parha kryn panic mat hua kryn apky parents ky bohat khawab hoty hn wo pura krny ki puri koshish kea kryn kbi b ksi pe depend na kea kryn apko bs ak insan success kr saqta ha or wo insan ap khud hn apky elawa koi nahe ap bs koshish kryn Allah pak pe strong yakeen rakha kryn or mehnat krke sb Allah ke hawaly kr dea kryn everything is possible be brave be strong stay blessed

Hum insan hamesha moat se darty or bhagty hn or moat se bachny ki koshish krty hn jabke moat ny ana hi ana ha hum

moat se nahe bach saqty humy jahanam se bachny ki koshish
krni chaheay hum jahanam se bach saqty hn
Insan ko 3 chezo se dar lagta ha Moat Risk/Dolat Ezat Shohrat
Fame

Moat

**Humy pta hona chaheay Moat tab ani ha jab Allah
chahy us se pehly puri dunya bi ak taraf ho ke apko
marna chahy to apka kuch nahe beggar saqti**

Risk/Dolat

**Risk Dolat sb Allah pak ke hath m ha puri dunya ak
taraf b ho jay na apsy apka risk cheen saqti ha na de
saqti ha Ye sirf ALLAH pak ky hath m ha**

Izat Zilat shohrat Fame

**Izat Zilat Sirf Allah de saqty hn puri dunya mel ke b
apko zra brabr b damage nahe kr saqti Agr ALLAH**

**Apko izat dena chahay to puri dunya ak taraf ho ke
b apko 1% b nuksan nahe pohancha saqti**

Phr Dar ks bat ka ??????????????????

**Be brave be strong Just put your trust To ALLAH
Hamesha Confident or himat se raho kbi ksi k samne
mat jhuko puri dunya mel k b apka kuch b nahe
beggar saqti**

ZB
MY REQUEST FROM ALL OF YOU

ZB Request from All of you My family

Mjy ap sbki help or support ki zarort ha or wo ye k hum sb Mel kr Allah ka Quran ki Urdu translation logo tak pohanchy or Quran ko samjna asaaan kryn dosro k leay sb tak Allah ka Quran pohanchy it's my campaign hum log 70+ age k ho jaty hn phr b hmy namaz tak ki translation nahe pta hoti k hum Allah pak se

Kya Dua kr rhy hn so hum youngster's ko Mel kr puri takat or energy ke sath Allah ka Quran spread krna ha

Hum puri Koshish kr rhy hn k hum sb Mel k Quran ki translation or most important topics ko maximum share kry with translation hmara maksad Quran ko spread krna ha be a part of us

m apni pocket se ye sb kr rha ho Allah ka Quran spread krny k leay apne or mene sbny Marna ha ak din to q na Allah k leay Kuch kryn apni energies apni power ko bajay negative use krny k Allah k leay invest kryn khud ko be a part of us

Agr m 23 ki age m apny sare sources use kr rha ho pocket se heavy amounts give away kr rha ho Quran spread krny k leay to ap just share to kr saqty hn itna e kr dyn

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Agr ap mujsy contact na kr sky too b ap jo b hn jaha bi hn waha Allah ka quran pheelay zada se zada with urdu translation jitni himat ha utna share kryn

..... **MY Family**

**ust Relax and focus! Exams are not difficult. Put in your
100% effort and trust in Allah.**

..... **AL-Quran**

**"And indeed, with hardship comes ease." (Quran 94:5)
Remember, I'm here to support you! Stay brave and strong!"**

May Allah bless you