



STA301

Quiz for Final-Term

ABSTRACT

This comprehensive collection of notes is accurately crafted to empower students to excel academically, ensuring they achieve a minimum of 80% marks in their examinations. The content is organized with clarity and precision, focusing on key concepts, critical analyses, and practical applications tailored to the syllabus. These notes serve as a reliable resource for both thorough preparation and last-minute revision. Designed to inspire confidence and mastery, this guide is an essential tool for students striving for academic excellence.

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1. If (X) is a continuous random variable starting from 0, what is (P(X))? (0)
2. What is the parameter of the Chi-square distribution? (v (Degrees of Freedom))
3. If all possible samples are drawn from a population, the probability distribution of the sample means is called? (Sampling Distribution)
4. A normal distribution has ($\sigma = 55$) and ($\sigma = 10$). What is the area within one standard deviation of the mean? (68.26%)
5. A hypothesis test always starts with which hypothesis? (Null Hypothesis (H_0))
6. At a 95% confidence interval, if the interval is 32.4% to 47.6%, what is the sample proportion? (47.6%)
7. In a binomial experiment, the total number of trials is? (Fixed)
8. There are 5 treatments and 4 blocks in a Randomized Complete Block Design. What are the degrees of freedom for blocks? (3)
9. In a 3×3 contingency table, what are the degrees of freedom? (4)
10. Which distribution is used to construct confidence limits for the population variance? (Chi-square Distribution)
11. If ($\alpha = 0.01$) for a two-tailed test, what are the critical values? (± 2.576)
12. In interval estimation, what is estimated? (A range of values)
13. A random sample of 400 students is taken, and 46% answered "Yes." This 46% represents a? (Sample Statistic)
14. If two random variables are independent, their covariance is? (0)
15. The F-distribution ranges from? (0 to Positive Infinity)
16. In which distribution are the mean and variance equal? (Poisson Distribution)
17. Which assumption is NOT required for ANOVA? (Dependent Samples)
18. The finite population correction (FPC) is used when sampling from a finite population? (Without Replacement)
19. For a t-distribution with sample size ($n = 6$), what are the degrees of freedom? (5)
20. The paired t-test is used for? (Two Dependent Samples)
21. The marginal density function is obtained from? (The Joint Density Function)

22. If the level of significance is α , the critical region is represented by? (**The rejection region based on α**)
23. Sample variance is an unbiased estimator of? (**Population Variance (σ^2)**)
24. What is the variance formula for the t-distribution? (**$\frac{s^2}{n}$**)
25. If the population variance is unknown and the sample size is small, which distribution is used for the confidence interval of the population mean? (**t-Distribution**)
26. The proportion of males in Pakistan is at least 0.48. What is the null hypothesis? (**$H_0: p \geq 0.48$**)
27. The proportion of working females is at most 0.30. What is the alternative hypothesis? (**$H_a: p < 0.30$**)
28. Which distribution is used to construct a confidence interval for the ratio of two variances? (**F-Distribution**)
29. The Chi-square distribution is a continuous distribution ranging from? (**0 to Positive Infinity**)
30. What is the shape of the Normal distribution? (**Bell-shaped**)
31. If estimator (T_1) has a smaller variance than estimator (T_2) , then (T_1) is? (**More Efficient**)
32. In which distribution are the mean and variance equal? (**Poisson Distribution**)
33. When the confidence level decreases from 99% to 90%, the confidence interval becomes? (**Narrower**)
34. The normal distribution has how many parameters? (**Two (Mean and Standard Deviation)**)
35. The population proportion is represented by? (**P**)
36. As the sample size increases, the standard error? (**Decreases**)
37. Covariance of independent variables is: **Zero**
38. Which measure of dispersion is calculated from all observations? **Standard Deviation**
39. Which is a poor measure of dispersion for an open-end distribution? **Range**
40. Suppose every man married a woman exactly five years younger than himself. The correlation coefficient would be: **+1**
41. Which measure of central tendency is affected most by extreme values? **Mean**
42. The difference between the expected value of a statistic and the corresponding population parameter is called: **Bias**
43. The probability of the complement of event A is: **$1 - P(A)$**
44. The area under the standard normal curve between 0 and -1.75 is: **0.4599**
45. The curve of the F-distribution depends upon: **Degrees of Freedom**

46. The aggregate of all conceivable ways in which a specified event can happen is called: **Hypothetical Population**
47. The hypergeometric distribution has how many parameters? **Three**
48. In the regression equation ($Y = a + bX$), Y is called: **Dependent Variable**
49. If an estimator has an expected value equal to the true population parameter, it is called: **Unbiased Estimator**
50. A good point estimator should possess: **Consistency, Unbiasedness, and Efficiency**
51. The regression equation in slope-intercept form is: $\hat{y} = mx + b$
52. Compared with the standard normal distribution, the t-distribution is: **More Spread Out**
53. The combined distribution of two or more random variables is called: **Joint Distribution**
54. If the significance level is reduced from 5% to 1%, the null hypothesis becomes: **Less Likely to be Rejected**
55. A Chi-square value can never be: **Negative**
56. When sampling is done with replacement, the total number of possible samples is: N^n
57. A die is rolled. Probability (outcome > 2 and even): **1/3**
58. The estimator of a constant C is: **C**
59. The hypergeometric random variable is: **Discrete**
60. Deviation of a distribution from symmetry is called: **Skewness**
61. If X denotes heads in three coin tosses, X can take values: **0, 1, 2, 3**
62. Which statement is false? **$P(E) = -1$**
63. The distribution function is: **$F(x) = P(X \leq x)$**
64. Probability that a continuous random variable assumes a specific value is: **Zero**
65. If $E(X) = 1.5$, then $E(2X + 3)$: **6**
66. Sampling distribution of the difference of sample means (normal populations): **Normal**
67. Shape parameter of the normal distribution: **Standard Deviation**
68. Probability distribution of sample proportions is called: **Sampling Distribution of Sample Proportions**
69. Sum of probabilities in a PMF: **1**
70. Sample proportion formula: **X/n**
71. Outcomes in a binomial experiment: **Two**
72. Probability of Type II error: **β**
73. Temperature before and after medicine is an example of: **Natural Pairing of Data**
74. $1 - \alpha$ represents: **Acceptance Region (Confidence Level)**
75. Alternative hypothesis is denoted by: **H_1**
76. Interval estimation and confidence interval are: **The Same**
77. Median of the t-distribution: **Zero**
78. Sample size for estimating the population mean uses: **Z-value**

79. Level of significance is also called: **Type I Error**
80. Increasing sample size (with errors fixed) will: **Increase Power of the Test**
81. The t-distribution is used to test hypotheses about: **Mean**
82. The mean of the t-distribution does not exist when degrees of freedom equal: **1**
83. Pearson skewness > 0 indicates: **Positively Skewed**
84. Pearson skewness < 0 indicates: **Negatively Skewed**
85. Location of the critical region depends on: **Alternative Hypothesis**
86. Percentage below the fourth decile: **40%**
87. MF in the mode formula denotes: **Maximum Frequency**
88. Variance of the Chi-square distribution: **$2v$**
89. ANOVA was introduced by: **R. A. Fisher**
90. Estimator T is unbiased if: **$E(T) = \theta$**
91. Best unbiased estimator of population variance: **Sample Variance**
92. Variance of $4X + 5$: **$16 \text{ Var}(X)$**
93. If 50 out of 200 answered "Yes," the sample proportion is: **0.25**
94. Percentage within Median $\pm$ Quartile Deviation: **50%**
95. Height of a student is: **Continuous Data**
96. Mean of Poisson(0.135): **0.135**
97. Hypothesis testing begins by assuming: **Null Hypothesis is True**
98. The LSD test is applied only if: **Null Hypothesis is Rejected**
99. ANOVA compares: **Three or More Means**
100. In a normal distribution, B_2 equals: **3**
101. Power when $\alpha = 0.05$ and $\beta = 0.10$: **0.90**
102. Lottery tickets follow: **Discrete Uniform Distribution**
103. The Central Limit Theorem states: **The sampling distribution of the mean is approximately normal**
104. If $E(X) = 3.2$ and $E(Y) = 3$, then $E(X + Y)$: **6.2**
105. When two dice are rolled, the total number of sample points is: **36**
106. A property of the probability density function (PDF) is: **$f(x) \geq 0$**
107. Parameter of the Chi-square distribution: **v (Degrees of Freedom)**
108. When two coins are tossed, the probability of getting at most one head is: **$3/4$**
109. The sum of probabilities in a discrete probability distribution is: **1**
110. A random variable can be generated: **Manually and Mechanically**
111. The probabilities of various values of a sample statistic can be computed using the: **Classical Definition of Probability**
112. The mean of the F-distribution exists only when: **$v_2 > 2$**

113. When two coins are tossed simultaneously, the probability of getting exactly one head is: $\frac{1}{2}$
114. If the occurrence of one event does not affect another event, the events are: **Independent Events**
115. If a fair coin is tossed three times, the probability of getting at least one head is: $\frac{7}{8}$
116. A student solved 25 out of the first 50 questions of a book. The probability that a remaining question is unsolved is: $\frac{1}{2}$ (0.5)
117. When two dice are rolled, the total number of possible sample points is: **36**
118. The complement rule in probability is: $1 - P(A)$
119. The probability of any event always lies between: **0 and 1**
120. The probability of an impossible event is: **0**
121. The probability of a certain event is: **1**
122. The expected value of a constant (c) is: **c**
123. The variance of a constant is: **0**
124. The standard deviation is the positive square root of: **Variance**
125. The coefficient of correlation always lies between: **-1 and +1**
126. If the correlation coefficient equals +1, the relationship is: **Perfect Positive Correlation**
127. If the correlation coefficient equals 0, the variables have: **No Linear Correlation**
- 128.

The value of the coefficient of determination is:

Answer: r^2

For the Chi-square test of independence, the degrees of freedom are:

Answer: $(r - 1)(c - 1)$

129. The mean of the F-distribution exists only when:

Answer: $v_2 > 2$

130. The probability density function $f(x)$ must satisfy:

Answer: $f(x) \geq 0$

131. Variance of hypergeometric distribution is:

$$\frac{nK(N - K)(N - n)}{N^2(N - 1)}$$

133.

Accepting H_0 when H_0 is false is called:

Answer: Type II Error

134. Mean of F distribution:

Answer: $\frac{v_2}{v_2 - 2}$

135.

If $\sum_{i=1}^5 (x_i - 20) = 0$, then $\bar{x}$ equals:

Answer: 20

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