

Reg. No .....

Name .....

24P2054

**M. A. DEGREE END SEMESTER EXAMINATION - MARCH 2024**

**SEMESTER 2 - ECONOMICS**

**COURSE : 21P2ECOT10 - STATISTICAL TOOLS FOR ECONOMIC ANALYSIS**

*(For Regular 2023 Admission and Improvement/Supplementary 2022/ 2021 Admissions)*

Duration : Three Hours

Max. Weights: 30

**PART A**

**Answer any 8 questions**

**Weight: 1**

1. What do you mean by sampling distribution of a statistic? (U)
  2. Define a lognormal distribution. (R)
  3. Distinguish between Type I and Type II errors (R)
  4. Distinguish between null and alternative hypotheses. (U)
  5. Give any two uses of chi-square distribution. (R, CO 3)
  6. Distinguish between estimation of parameters and testing of hypothesis. (R)
  7. What is meant by confidence coefficient. (R)
  8. Distinguish between simple and composite hypothesis. (R)
  9. Define probability distribution? State its properties. (R)
  10. State addition rule and multiplication rule of probability. (R)
- (1 x 8 = 8)**

**PART B**

**Answer any 6 questions**

**Weights: 2**

11. Define Chi-square distribution. A random sample of size 16 is taken from a normal population with mean 30 and variance 64. Find the probability that the sample variance  $s^2$  will be less than the population variance. (A)
12. Define binomial distribution. Find the binomial distribution if the mean is 12 and the variance is 4 (A)
13. Explain how t test is used for paired comparison of difference of means. (U)
14. A company is known to produce 20% defective articles. What is the probability that in a random sample of 5 articles. (i) exactly 3 are defectives (ii) at least one defective. (A)
15. Define F statistic. What are the important applications of F distribution. (R)
16. Derive the confidence interval for the difference between two population means of 2 normal distributions with known standard deviations  $\sigma_1$  and  $\sigma_2$  (R)
17. Define confidence interval. Derive the confidence interval for  $\mu$  of  $N(\mu, \sigma)$  when the population standard deviation  $\sigma$  is unknown. (R, CO 3)
18. A sample of 400 observations taken from a population with standard deviation 15 have a mean of 27. Test whether the mean of the population is less than 24. ( $\alpha = 0.05$ ). (A)

**(2 x 6 = 12)**

**PART C**  
**Answer any 2 questions**

**Weights: 5**

19. Fit a binomial distribution to the following data  
 $X : 0 \quad 1 \quad 2 \quad 3 \quad 4 \quad 5$   
 $f(x) : 12 \quad 18 \quad 23 \quad 32 \quad 16 \quad 9$  (A)
20. Two independent samples of 7 and 8 items gave the following values. Examine whether they are taken from two populations having the same mean. (A, CO 3)  
 Sample A : 8    12    10    12    15    9    10  
 Sample B : 10    14    12    16    7    8
21. (i) Explain Chi-square test of independence (ii) The following table show the distribution of 1,000 school boys according to their general ability and their mathematical ability. Examine whether they are independent. (A)
- | Mathematical ability | General Ability |      |      |
|----------------------|-----------------|------|------|
|                      | Good            | Fair | Poor |
| Good                 | 44              | 22   | 4    |
| Fair                 | 265             | 257  | 178  |
| poor                 | 41              | 91   | 98   |
22. Discuss the maximum likelihood method of estimation. Obtain the m.l.e. of the parameter  $\lambda$  of Poisson distribution. (U)  
**(5 x 2 = 10)**

**OBE: Questions to Course Outcome Mapping**

CO	Course Outcome Description	CL	Questions	Total Wt.
CO 3	Understands Estimation - point and interval PO1/PSO1 U estimation. Method of Estimation, Maximum Likelihood Estimation and Method of moments. Confidence interval for the mean of a population using small and large samples.	U	5, 17, 20	8

Cognitive Level (CL): Cr - CREATE; E - EVALUATE; An - ANALYZE; A - APPLY; U - UNDERSTAND; R - REMEMBER;