Reg. No ..... Name **23P2054**

M. A. DEGREE END SEMESTER EXAMINATION : MARCH 2023

SEMESTER 2 : ECONOMICS

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

(For Regular - 2022 Admission and Supplementary - 2021 Admission)

Duration : Three Hours Max. Weights: 30

(Use of Scientific Calculators and Statistical tables permitted)

PART A

Answer any 8 questions **Weight: 1**

1.	Define random variable. write down the probability distribution function of a continous random variable	(R)
2.	What is unbiasedness ?	(R)
3.	Define sampling distributions	(R)
4.	Explain the method of maximum likelihood estimate.	(R)
5.	State central limit theorem.	(R)
6.	What is test statistic	(U)
7.	What is statistical hypothesis	(R)
8.	What do you mean by lognormal distribution	(R)
9.	Write the test 'statistic' for testing the mean of a normal distrinution with known standard deviation	(R)
10.	Given the probability of defective screws is 1/6. Find the mean for the binomial distribution of defective screws in a total of 180.	(A, CO 1)

(1 x 8 = 8)

PART B

Answer any 6 questions **Weights: 2**

11.	Explain small sample tests and large sample tests	(R)
12.	Derive the confidence interval for population mean μ of $N(\mu, \sigma)$ of a large sample, when population standard deviation σ is unknown	(R)
13.	Define Chi-square, 't' and F distributions. What are the important aapications for these distribution?	(R)
14.	A sample of 400 observations were taken form a population with standard deviation 15. If the mean of the sample is 27. Test whether the hypothesis that the mean of the population is less than 24. $(\alpha = 0.05)$.	(A)
15.	Explain how t test is used for paired comparison of difference of means	(U)
16.	If f(x) =2x for 0≤x≤1 is the p.d.f of a random variable x, find the mean and variance of x	(A)
17.	State and prove addition theorem on probability	(R)
18.	Explain methods of estimation .	(R)

(2 x 6 = 12)

PART C

Answer any 2 questions **Weights: 5**

19. Fit a binomial distribution to the following data (A)

X :	0	1	2	3	4	5
f(x) :	12	18	23	32	16	9

20. Define interval estimation. The following sample was taken from a normal population. Find the 95% confidence interval for mean of the normal population. 24, 18, 33, 27, 25, 30, 22, 28, 31, 29, 17, 27. (A)

21. Explain the two sample t-test. The daily wages (in Rs.) of some randomly selected workers from two firms of the same type are given below. On the basis of the samples, can it be concluded that the mean wages of the workers of the two firms are the same. Assume wages follwo normal distribution. (A)

Sample I : 300,350,280,320,260,340

Sample II : 260,400,340,280,360,350,150,280

22. (i) Explain Chi- square test of independence (ii)The following data was obtained in an investigation about the effect of vaccinatin for small pox. Examine whether vaccination is effective in preventing small pox (A)

	Vaccinated	Not vaccinated
Attacked by small pox	3	12
Not attaked	11	17

(5 x 2 = 10)

OBE: Questions to Course Outcome Mapping

CO	Course Outcome Description	CL	Questions	Total Wt.
CO 1	Understand the concepts of Probability, Random variables- Discrete and continuous types, probability distribution functions and its properties. Understand Mathematical Expectation, moments. Standard distributions –binomial, Poisson, normal and lognormal distributions. Understand and apply Central limit theorem	U	10	1

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