

M. A. DEGREE END SEMESTER EXAMINATION - MARCH 2020**SEMESTER – 2: ECONOMICS****COURSE: 16P2ECOT10 –: STATISTICAL TOOLS FOR ECONOMIC ANALYSIS***(Common for Regular – 2019 Admission & Supplementary 2018/ 2017/2016 Admission)*

Time: Three Hours

Max. Marks: 75

*(Use of Scientific Calculators and Statistical tables permitted)***PART A***Answer **any eight** questions. Each question carries **2** marks*

1. Define probability density function of a random variable.
2. Examine whether the following is a probability distribution

x	-1	0	1	2	3
P(x)	0.2	0.3	0.1	0.2	0.2

3. What do you understand by probability mass/density function?
4. Define Binomial distribution. Comment on the statement “The mean of a binomial distribution is 4 and variance is equal to 5”.
5. What do you mean by standard error?
6. What is the relation between a student’s t distribution and F distribution?
7. Define moments and its relevance in probability distributions.
8. Define raw moments.
9. Define null and alternative hypotheses with examples.
10. Define the standard normal distribution.
11. If $f(x) = kx$ $0 \leq x \leq 1$, find the value of k.
12. What are the properties of a good estimate? (2 x 8 = 16)

PART B*Answer **any seven** questions. Each question carries **5** marks*

13. Derive the mean and variance of Poisson distribution.
The number of mistakes counted in 100 typed pages of a typist revealed that he made 2.8 mistakes on an average per page. Find the probability that
 - i) there is no mistake
 - ii) there are two or less mistakes, in a page, typed by him.
14. Explain paired t-test.
15. A basket contains 30 bad oranges and 70 good oranges. Four are drawn at random from this basket. Find the probability that out of four 1) exactly two 2) atleast two are good.
16. If a discrete random variable has the probability function as,

x :	0	1	2	3	4	5	6	7	8
P(x):	c	2c	3c	5c	5c	4c	3c	2c	c

 Find i) the value of c ii) E(x)

17. When studied 150 patients, only 90 are survived, find 95% confidence interval for the proportion of survivals in the disease.
18. Define lognormal distribution. Explain the applications of lognormal in economics.
19. Explain i) Type I and Type II errors ii) Significance level and power of the test.
20. The sample mean from a random sample of size 50 drawn from a population has the value 52.5. The population standard deviation is known to be equal to 16. Find 95% confidence interval for the population mean.
21. Differentiate between one tailed and two tailed tests, using examples.
22. Explain the method of testing proportion of single population.

(5 x 7 = 35)

PART C*Answer any two questions. Each question carries 12 marks*

23. Describe the Chi-square test of independence.

It is claimed that more IAS selections are made from cities rather than rural places. On the basis of the following data, do you agree with the claim?

	Selected	Not selected
From cities	500	200
From rural places	100	30

24. State Assumptions of normal distribution. Marks of 600 students are found to be normally distributed with mean 40 and standard deviation 5. Estimate the number of students having marks a) less than 35 b) exactly equal to 38 c) between 32 and 50.
25. Explain the concept ANOVA? Write the assumptions:

Following are the weekly sales records of three sales man A, B, and C of a company .

A	250	350	250	450	
B	550	250	250	350	
C	650	250	350	550	450

Test whether the sales of three salesman are different, $\alpha=0.05$

26. How will you test the independence of two attributes?

Following table provides data with regard to stature of the fathers and their first sons at the age of 25 years.

	Stature of Fathers		
	Tall	Short	Total
Tall	8	2	10
Short	7	6	13
Total	15	8	23

Test that stature of sons is independent of the stature of the fathers.

(12 x 2 = 24)