LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

B.A. DEGREE EXAMINATION – **ECONOMICS**

THIRD SEMESTER – **NOVEMBER 2019**

EC 3503 – QUANTITATIVE METHODS IN ECONOMICS

Date: 29-10-2019 Dept. No. Max. : 100 Marks

Time: 01:00-04:00

PART-A

Answer any **FIVE** Questions in about 75 words each: **(5x4=20marks)**

1) Define the Classical Probability.
2) Distinguish between Simple event and Composite event.
3) State the probability function of Poisson distribution. What are its properties?
4) State any four theorems on Mathematical Expectations.
5) Distinguish between Type I error and Type II error.
6) Write a note on Latin Square Design.
7) Distinguish between Small sample test and Large Sample test.

PART –B

Answer any **FOUR** Questions not exceeding 250 words each: **(4x10=40marks)**

8) State and prove the Theorems on Probability.
9) Eight coins are tossed at a time, 256 times. Find the expected frequencies of success (getting a head) and tabulate the result obtained.
10) Daily demand for transistors is having the following probability distribution:

Demand:	1	2	3	4	5	6
Probability:	0.10	0.15	0.20	0.25	0.18	0.12

Determine the daily demand for transistors. Also obtain the variance of the demand.

11) 1000 students at college level were graded according to their I.Q and the economic conditions of their homes. Use χ^2 test to find whether there is any association between economic condition at home and I.Q.

Economic Condition	I.Q		
	High	Low	Total
Rich	460	140	600
Poor	240	160	400
Total	700	300	1000

[Hint: $\chi^2_{\alpha = 0.05,\ 1df} = 3.84$]

12) Explain the steps involved in the calculation of ANOVA One – Way classification.

13) The mean life time of a sample of 400 fluorescent lights tube produced by a company is found to be 1570 hours with a standard deviation of 150 hours. Test the hypothesis that the mean lifetime of the bulbs produced by the company is 1600 hours against the alternative hypothesis that it is greater than 1600 hours at 1% level of significance.

[Hint: $Z_{\alpha=0.01} = 2.33$].

14) A machinist is making engine parts with axle diameter of 0.700 cm. A random sample of 10 parts show a mean diameter of 0.742cm with a standard deviation of 0.040 cm. Compute the statistic you would use to test whether work is meeting the specification. State how you would proceed further.

[Hint: $t_{\alpha\ 0.05,9d:f}= 2.26$]

PART-C

<u>Answer any **TWO** Questions not exceeding 900 words each:</u> **(2x20=40marks)**

15) A) State and prove the Bayes' Theorem. **(10 marks)**

B) A company has two plants to manufacture scooters. Plant I manufactures 80% of the scooters and Plant II manufactures 20%. At plant I, 85 out of 100 Scooters are rated standard quality or better. At plant II only 65 out of 100 are rated standard quality or better.

(i) What is the probability that a scooter selected at random came from plant I if it is known that the scooter is of standard quality?

(ii) What is the probability that a scooter selected at random came from plant II if it is known that the scooter is of standard quality? **(10 marks)**

16) A) State the various properties of Normal Distribution. **(10 marks)**

B) What is the probability that a standard normal variate Z will be?

(i) Greater than 1.09.

(ii) Less than -1.65.

(iii)Lying between -1.00 and 1.96.

(iv) Lying between 1.25 and 2.75. **(10 marks)**

17) Elucidate the procedure of Testing of Hypothesis.

18) Perform a Two – Way ANOVA on the data given below and test whether the productivities are the same for different plots and treatments.

Plot of Land	Treatment			
	A	B	C	D
I	38	40	41	39
II	45	42	49	36
III	40	38	42	42

(Use Coding method by subtracting 40 from the given numbers).

[Hint: $F_{\alpha=0.05,(3,6)df}= 4.76$ and $F_{\alpha=0.05,(2,6)df}= 5$]

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