LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

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

SECOND SEMESTER – APRIL 2017

16UEC2MC02 - QUANTITATIVE METHODS IN ECONOMICS

Date: 25-04-2017   Dept. No.   Max. : 100 Marks
Time: 01:00-04:00

PART – A

Answer any **FIVE** questions: **(5 x 4 = 20 marks)**

1. State the probability density function (pdf) and properties of Binomial distribution.

2. Following table gives the wages paid to 125 workers in a factory. Calculate the arithmetic mean.

Wage X_i per hour	240	250	260	270	280	290	300
No. of workers	5	15	32	42	15	12	4

3. Find out the co-efficient of correlation

X:	64	65	66	67	68	69	70
Y:	66	67	65	68	70	68	72

4. State the Addition and Multiplication theory of probability with an example.

5. A problem in statistics is given to three students A, B and C whose chances of solving are $\frac{1}{2}, \frac{1}{3}$ and $\frac{1}{4}$ respectively. What is the probability that the problem is solved?

6. The incidence of occupational disease in an industry is such that the workers have 20% chance of suffering from it. What is the probability that out of six workers

    a) 4 or more will contact disease?

    b) 2 or more will contact disease?

7. Write short notes on:

    a) Type I error

    b) One tailed Test

    c) Level of Significance.

Answer any **FOUR** questions: **(4 x 10 = 40 marks)**

8. The profit (in Lakhs of rupees) earned by 100 companies during 2015 – 2016are shown below:

Profits	No. of companies
20-30	4
30-40	8
40-50	18
50-60	30
60-70	15
70-80	10
80-90	8
90-100	7

Compute standard deviation.

9. Explain the properties of Normal distribution.

10. Given the data on the entrance fee and the number of spectators at on entertainment place

Entrance fee (in Rs.)	50	55	60	65	70	75	80	85
Numbers of visitors:(in hundered)	20	17	16	14	13	10	9	5

Using regression, estimate the number of visitors If the entrance fee is fixed as 25.

11. The first proof of 200 pages of a book containing 560 pages revealed the following distribution of the number of printing errors.

No. of errors in a page	0	1	2	3	4	5	Total
No. of pages	112	63	20	3	1	1	200

Fit a Poisson distribution corresponds to these data.

12. Find out the missing frequency from the following if Arithmetic mean of the distribution is 28.

Profit per shop in '000' rupees	0-10	10-20	20-30	30-40	40-50	50-60
Number of shops	12	18	27	x	17	6

13. Explain the significance of:

        A) 't' statistic.
        B) χ^2 statistic.

14. 1000 families were selected at random in a city to test the belief that high income families usually send their children to public schools and the low income families often send their children to government schools. The following results were detained.

Income	School Public	School Government	Total
Low	370	430	800
High	130	70	200
Total	500	500	1000

Test whether Income and type of schooling are independent. [Hint: $\chi^2_{\alpha=0.05, v=1}=3.84$]

PART – C

Answer any **TWO** questions   **(2 x 20 = 40 marks)**

15. How do the researchers formula hypothesis? Explain the process of testing the hypothesis.

16. Compute the mean, median and mode for the following data:

Class	Frequency
50-53	3
53-56	8
56-59	14
59-62	30
62-65	36
65-68	28
68-71	16
71-74	10
74-77	5

17. a) Find the chance of throwing more than 15 in one throw with 3 dice. [10 marks]

    b) Sample of two different types of bulbs were tested for length of life and the following data were obtained.

	Type - I	Type – II
Sample size	8	7
Sample mean	1234 hrs	1136 hrs
Sample S.D.	36 hrs	40 hrs

   Is the difference in the means significant? [hint $t_\alpha = 2.16$]   [10 marks]

18. National Transport Safety Board wants to examine the safety of compact cars, midsize cars and full size cars. If collect a sample of three for each of the types. Using data given below Test whether the mean pressure applied to the driver's head during a crash test is equal for each type of car using ANOVA.

Compact cars	Midsize carts	Full size cars
643	469	484
655	427	456
702	525	402

   [Hint: $F_\alpha = 5.14$]

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