



LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

B.A. DEGREE EXAMINATION - ECONOMICS

THIRD SEMESTER – NOVEMBER 2015

EC 3503 - QUANTITATIVE METHODS IN ECONOMICS

Date : 04/11/2015

Dept. No.

Max. : 100 Marks

Time : 09:00-12:00

PART – A

Answer any FIVE questions in about 75 words each: (5 x 4 = 20 marks)

1. 'A' can solve 90 percent of the problems given in a book and 'B' can solve 70 percent. What is the probability that at least one will solve the problem selected at random?
2. Define 'Power of the Test'
3. Write down the properties of mathematical expectation.
4. What the difference is between Type I error and Type II error?
5. An industrial salesman wants to know the average number of units he sells per sales call. He checks his past sales records and comes up with the following probabilities

Sales in units	0	1	2	3	4	5
Probability	0.15	0.20	0.10	0.05	0.30	0.20

What is the average number of units he sells per sales call?

6. Write a short note on 'Randomized Block Design'.
7. In a distribution exactly normal 7 % of the items are under 35 and 79 % are under 63. What is the mean and standard deviation of this distribution?

PART-B

Answer any FOUR questions in about 300 words each: (4 x 10 = 40 marks)

8. Explain the Addition and Multiplication theorems of probability with suitable examples.

9. Sixty percent of the employees of an MNC are college graduates. Of these, ten percent are in sales. Of the employees who did not graduate from college, eighty percent are in sales. What is the probability that;

- a) An employee selected at random is in sales.
- b) An employee selected at random is neither in sales nor a college graduate?

10. Explain the properties of Normal Distribution.

11. A typist kept a record of mistakes made per day during 300 working days of a year. Fit a Poisson distribution to the data:

Mistakes per day (X)	0	1	2	3	4	5	6
Number of days	143	90	42	12	9	3	1

(Given $e^{-0.89} = 0.40656$)

12. The hourly wages of 1000 workers are normally distributed around a mean of Rs. 70 and with a standard deviation of Rs. 5 . Estimate the number of workers whose hourly wages will be:

- a) Between Rs. 70 and Rs. 72.
- b) More than Rs. 75.
- c) Less than Rs 63.
- d) Between Rs. 69 and Rs .72.

13. Explain the suitability of applying One - tailed and Two- tailed tests in testing of hypothesis with examples.

14. A Dice is tossed 120 times with the following results:

Number turned up	1	2	3	4	5	6	Total
Frequency	30	25	18	10	22	15	120

Test the hypothesis that the dice is unbiased. (hint: $\chi^2_{=0.05} = 11.07$)

PART – C

Answer any TWO questions in about 900 words each:

(2 x 20 = 40 marks)

15. Two types of drugs were used on 5 and 7 patients for reducing their weight. Drug A was imported and drug B indigenous. The decrease in the weight after using the drugs for six months was as follows:

Drug A	10	12	13	11	14	-	-
Drug B	8	9	12	14	15	10	9

Is there a significant difference in the efficacy of the two drugs?

(for $v = 10$; $t_{0.05} = 2.228$)

16. A mobile phone producers' association wishes to test whether the preference pattern of consumers for its product is dependent on income levels . A random sample of 500 families gives the following data. Can you conclude that the pattern are independent of income levels?

(use χ^2 analysis)

INCOME	PRODUCT PREFERRED		
	PRODUCT -A	PRODUCT – B	PRODUCT - C
LOW	170	30	80
MIDDLE	50	25	60
HIGH	20	10	55

17. A Tea company appoints four sales man A,B , C and D and observes their sales in three seasons – summer , winter and monsoon. The figures are given in the following table:

Seasons	salesmen				Total (seasons)
	A	B	C	D	
Summer	36	36	21	35	128
Winter	28	29	31	32	120
Monsoon	26	28	29	29	112
Salesmen's total	90	93	81	96	360

Carry out an Analysis of Variance.

(for $v_1 = 3$ and $v_2 = 6$; $F_{0.05} = 4.76$)

18. Explain the nature , properties and fitting process of Binomial Distribution using a suitable illustration.

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