



LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

B.A. DEGREE EXAMINATION – ECONOMICS

THIRD SEMESTER – NOVEMBER 2014

EC 3503 - QUANTITATIVE METHODS IN ECONOMICS

Date : 31/10/2014
Time : 09:00-12:00

Dept. No.

Max. : 100 Marks

Part – A

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

1. What is the probability of getting exactly 3 heads in four tosses of a fair coin?
2. Define Bayes' Theorem
3. Find the mean μ and variance σ^2 of a binomial distribution with $n = 12$ and $p = 0.45$.
4. Distinguish between One tailed and Two tailed tests.
5. Let X be a random variable with the following probability distribution

x	15	20	25	30
P(X = x)	0.3	0.3	0.2	0.2

Find $E(X)$ and $E(X^2)$.

6. The area under the standard normal curve between the points 0 and 2.9 is 0.4981. Find out the area between the points -2.9 to 2.9 . Show this in a diagram.
7. What is Latin Square Design?

Part – B

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

8. Explain the significance of a Random Variable.
9. A bag contains 7 red , 12 white and 4 green balls. What is the probability that
 - a. 3 balls drawn are all white and
 - b. 3 balls drawn are one of each colour and
 - c. 4 balls drawn are all red ?
10. What are the properties of Normal Distribution ? How does it differ from Binomial and Poisson distribution?

11. New Age bank is interested in planning, how much cash to be kept in vault. The branch manager of the bank is trying to study the profile of average deposits of its customers for the purpose. The information collected by him is as follows.

Deposits(Rs.)	Less than 5000	5000 - 10000	More than 10000
Observed frequency	22	61	17

What are the expected frequencies if the data are normally distributed with mean of Rs. 6000 and standard deviation of Rs. 3000 ?

12. Bring out in detail the process of testing a hypothesis.

13. A manufacturer of TV tubes has for many years used a process giving a mean tube life of 4700 hours and a standard deviation of 1460 hours. A new process is tried to see if it will increase the life time significantly. A sample of 100 new tubes gave a mean life of 5000 hours. Is the new process better than the old at 1 percent level of significance? ($Z_{0.01} = 2.33$)

14. The following figures show the distribution of digits in number chosen at random from a list of cell phone numbers

Digits	0	1	2	3	4	5	6	7	8	9
Frequency	1026	1107	997	966	1075	933	1107	972	964	853

Test at 5 percent level whether the digits may be taken to occur equally frequently in the list. (at 5 % level with d.f = 9 the χ^2 value is 16.919)

Part – C

Answer any TWO questions in about 900 words each. (2 x 20 = 40)

15. In order to test whether declaration of dividends has any effect on the market price of a share of a company a random sample of 8 companies was taken from companies which have declared at least 15 % dividends. The data regarding share prices of the sample companies is

	1	2	3	4	5	6	7	8
Market price 10 days before dividends were declared	70	65	112	58	25	147	95	68
Market price 10 days after dividends were declared	80	85	110	64	32	159	100	70

Test whether the increase in market price after declaration of dividends is significant or not using 't' test..

16. Explain different methods of Design of experiments with its merits and demerits.

17. Sales manager of a leading news paper which brings out its editions in morning as well as evening wanted to know its readership profile. He conducted a survey and prepared the findings in the following table. Test whether the educational qualifications determine the reading habit. (at 5 % level of significance with d.f = 9 the χ^2 value is 16.919)

Frequency of readership	Post graduates	Under graduates	High school educated	Primary school educated
Never	10	17	11	21
sometimes	12	23	8	5
Morning or Evening	35	38	16	7
Both editions	28	19	6	13

18. A research company has designated three different systems to clean up oil spills. The following table contains the results, measured by how much surface area (in square meters) is cleared in on hour. The data were found by testing each method in several trials .

System A	53	60	63	56	59	55
System B	57	53	64	49	62	--
System C	66	52	61	57	--	--

Test the results whether three systems are equally effective or not at 5 % level of significance. ($F_{(2, 12, 5\%)} = 3.89$)
