



LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

M.A. DEGREE EXAMINATION – ECONOMICS

THIRD SEMESTER – APRIL 2016

ST 3902 - STATISTICS FOR ECONOMISTS

Date: 06-05-2016
Time: 09:00-12:00

Dept. No.

Max. : 100 Marks

SECTION – A

Answer ALL questions:

(10x2=20)

- 1) State any two measures of central tendency.
- 2) Define correlation.
- 3) Define independent events.
- 4) What are the parameters of normal distribution?
- 5) Define type II error.
- 6) What is the test statistic for testing the equality of proportion in large sample?
- 7) Write the four components of time series.
- 8) Give the formula for Dorbish-Bowley’s index number.
- 9) Define unbounded solution of a Linear Programming Problem.
- 10) State any two methods of obtaining I.B.F.S of a transportation problem.

SECTION- B

Answer any **FIVE** of the following:

(5 X 8 = 40)

- 11) Find the mean and median for the following data given wages of 230 persons.

Wages in Rs.	70-80	80-90	90-100	100-110	110-120	120-130	130-140	140-150
No. of persons	12	18	35	42	50	45	20	8

- 12) Find the regression equation of output on cost of the cars of an automobile factory from the following data:

Output of cars (in ‘000)	35	42	56	65	70	82	88	90	97	100
Cost of cars (Rs.’000)	98	90	88	84	83	82	82	80	80	81

- 13) Five men in a company of 20 are graduates. If 3 are picked out from this 20 persons random, what is the probability that (i) all are graduates (ii) exactly 2 are graduates and (iii) atleast one is a graduate.
- 14) A random variable X has the following probability function:

X	0	1	2	3	4	5	6	7
P(x)	0	m	2m	2m	3m	m ²	2 m ²	7 m ² +m

 - (i) Find the value of m (ii) Evaluate (a) p(X< 3), (b) p(X ≥ 6) and (c) p(1 < X < 4) inclusively.
- 15) Number of road accidents during a month follows Poisson distribution with mean 6. Find the probability that in a certain month number of accidents will be (i) not more than 3, (ii) between 2 and 4 inclusively and (iii) exactly 5?
- 16) The customer accounts of a certain departmental store have an average balance of Rs.120 and a standard deviation of Rs. 40. Assuming that the account balances are normally distributed, find what proportion of accounts is (i) over Rs.150, (ii) between Rs.100 and Rs.150 and (iii) between Rs.60 and Rs.90?

- 17) From the following data, calculate price index numbers for 2014 with 2010 as base by:
 (i) Laspeyre's method, (ii) Paasche's method and (iii) Fisher's ideal method

Commodity	2010		2014	
	Price	Quantity	Price	Quantity
A	20	4	40	5
B	50	5	60	6
C	40	5	50	10
D	20	10	20	8

- 18) A departmental head has four subordinates and four tasks to be performed. The subordinates differ in efficiency and the tasks differ in their intrinsic difficulty. His estimate of the time each man would take to perform each task, is given in the matrix below.

Men	Tasks			
	I	II	III	IV
Sriram	18	26	17	11
Charles	13	28	14	26
Karthik	30	19	18	15
Praween	19	26	24	10

How should the tasks be allocated, one to a man, so as to minimize the total man-hours?

SECTION – C

Answer any **TWO** of the following: (2 X 20 = 40)

- 19) (i) Find the Correlation coefficient between Y and X for the following data:

X	25	28	35	32	36	36	29	38	34	32
Y	43	46	49	41	36	32	31	30	33	39

- (ii) Find the mode and median for the following data given below:

Marks in Statistics	20-30	30-40	40-50	50-60	60-70	70-80
No. of students	2	5	8	2	2	1

(10+10)

- 20) (i) There are 3 boxes containing respectively 1 white, 2 red, 3 black balls; 2 white, 3 red, 1 black balls; 3 white, 1 red and 2 black balls. A box is chosen at random and from it two balls are drawn at random. The two balls are 1 red and 1 white. What is the probability that they come from the second box?
- (ii) If 10% of the screws produced by an automatic machine are defective, find the probability that of 20 screws selected at random, there are (i) exactly two defectives, (ii) at the most 3 defectives and (iii) between one and four defectives. (12+8)

21) (i) A company arranged an intensive training course for its team of salesmen. A random sample of 10 salesmen was selected and the value (in '000) of their sales made in the weeks immediately before and after the course are shown in the following table.

Salesman	1	2	3	4	5	6	7	8	9	10
Sales before	12	23	5	18	10	21	19	15	8	14
Sales after	18	22	15	21	13	22	17	19	12	16

Test whether there is evidence of an increase in mean sales.

- (ii) In a sample of 600 parts manufactures by a factory, the number of defective parts was found to be 45. The company however claimed that only 5% of their product is defective. Is the claim tenable? (12+8)

22) (i) Fit a trend equation for the following data:

Year	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Sales ('000 rupees)	12	14	15	18	20	22	25	26	28	30

- (ii) Determine an initial basic feasible solution to the following transportation problem using the Vogel's approximation method.

Distribution centres

Factory	Mumbai	Bangalore	Delhi	Chennai	Available
Kolkatta	6	5	8	8	30
Cochin	5	11	9	7	40
Ranchi	8	9	7	13	50
Requirement	20	30	45	25	

(10+10)