LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

M.A. DEGREE EXAMINATION - **ECONOMICS**

THIRD SEMESTER – NOVEMBER 2011

ST 3902 - STATISTICS FOR ECONOMISTS

Date : 10-11-2011   Dept. No.   Max. : 100 Marks
Time : 9:00 - 12:00

SECTION- A

Answer **ALL** the following: (10 X 2 = 20)

1) State any two measures of dispersion.
2) Write down the two linear regression equations.
3) Define independent event.
4) What is the parameter of Poisson distribution?
5) Define type II error.
6) Give any two application of Chi-square test.
7) Define Index number.
8) State any two methods of measuring the trend.
9) Define Linear Programming.
10) What is an assignment problem?

SECTION- B

Answer any **FIVE** of the following: (5 X 8 = 40)

11) Find the median and mode for the following data:

Age(yrs)	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55
No. of employees	13	29	46	60	112	94	45	21

12) Using the appropriate regression line find y when x = 64 from the following data:

X	65	66	67	67	69	71	72	70	65
Y	67	68	69	68	70	70	69	70	70

13) Each of six urns contains black and white balls. One has eight white and 4 black balls, two have six white and 6 black balls and three have 4 white and 8 black balls. An urn is drawn at random and 3 balls are drawn without replacement from that urn. Two of the three are white and the other is black. What is the probability that the urn drawn contained 4 white and 8 black balls?

14) If the chance of running a bus service according to schedule is 0.8, calculate the probability on a day schedule with 10 services: (i) exactly one is late (ii) atleast one is late and (iii) atmost one is late.

15) The life of a certain kind of electronic device has a mean of 300 hours and a standard deviation of 25 hours. Assuming that the distribution of life times which are measured to the nearest hour can be approximated closely with a normal curve, (i) find the probability that any one of these devices will have a lifetime of more than 350 hours, (ii) What percentage will have life time from 220 to 260 hours?

16) Before increase in excise duty on tea, 400 people out of a sample of 500 persons were found to be tea drinkers. After an increase in duty, 400 people were tea drinkers out of a sample of 600 people. Using the standard error of proportion, state whether is a significant decrease in the consumption of tea?

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17) For the following data, calculate price index numbers by:
   (i) Laspeyre's method, (ii) Paasche's method and (iii) Fisher's ideal method

modity	Base year		Current year	
	Price	Quantity	Price	Quantity
A	6	50	10	56
B	2	100	2	120
C	4	60	6	60
D	10	30	12	24
E	8	40	12	36

18) Old hens can be bought for Rs. 2 each but young ones cost Rs. 5 each. The old hens lay 3 eggs per week and the young ones 5 eggs per week, each being worth 30 paise. A hen cost Re.1 per week to feed. If I have only Rs.80 to spend for hens, how many of each kind should I buy to give a profit of more than Rs. 6 per week, assuming that I cannot house more than 20 hens. Formulate the problem as a Linear Programming Problem.

SECTION – C

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

19) (i) Find the rank correlation coefficient for the data given below:

X	92	89	87	86	86	77	71	63	53	50
Y	86	83	91	77	68	85	52	82	37	57

   (ii) Find the quartile deviation and the coefficient of quartile deviation for the following data:

Class	0-10	10-20	20-30	30-40	40-50	50-60	60-70
Frequency	8	20	34	46	28	14	10

(10+10)

20) (i) The probabilities of 3 students Zico, Jay and Dinesh solving a problem in Statisitcs are ½, 1/3 and 1/4. A problem is given to all the 3 students. What is the probability that (i) no one will solve the problem, (ii) only one will solve the problem and (iii) atleast one will solve the problem?
   (ii) One-fifth per cent of the blades produced by a blade manufacturing factory turn out to be effective. The blades are supplied in packets of 10. Use Poisson distribution to calculate the approximate number of packets containing no defectives, 1 defective and 2 defective blades respectively in a consignment of 1,00,000 packets.   (10+10)

21) (i) A filling machine is expected to fill 5kg of powder into bags. A sample of 9 bags gave

the weights 4.7, 4.9, 5.0, 5.1, 5.2, 4.6, 5.1, 4.6 and 4.7. Test whether the machine is working properly.

(ii) A random sample of 200 tins of coconut oil gave an average weight of 4.95 kgs with a standard deviation of 0.21 kg. Do we accept the hypothesis of net weight 5kgs per tin at 1% level? (12+8)

22) (i) Fit a trend line by the method of least squares to the following data:

Year	1995	1997	1998	1999	2000	2001	2004
duction ('000 tor	77	88	94	85	91	98	90

(ii) Determine an initial basic feasible solution to the following transportation problem using the (a) north-west corner rule and (b) least cost method.

	D_1	D_2	D_3	D_4	Available
O_1	6	4	1	5	14
O_2	8	9	2	7	16
O_3	4	3	6	2	5
Requirement	6	10	15	4	

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