LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

M.A. DEGREE EXAMINATION – **ECONOMICS**

THIRD SEMESTER – APRIL 2010

ST 3902 - STATISTICS FOR ECONOMISTS

Date & Time: 30/04/2010 / 9:00 - 12:00 Dept. No. | | Max. : 100 Marks

SECTION A

Answer all the questions: **(10 x 2 = 20 Marks)**

1. Write any two properties of arithmetic mean.
2. If the mean and median for an asymmetric distribution are respectively 20 and 25 find an approximate value of mode.
3. Provide axiomatic definition of probability.
4. Define binomial distribution.
5. What are the probabilities of Type I and Type II errors?
6. Write any two applications of t distribution.
7. What is a time series ?
8. Define an index number.
9. Define basic solution to a given system of linear equations.
10. Express transportation problem as an LPP.

SECTION B

Answer any five questions: **(5x 8 = 40 Marks)**

11. Calculate mode using the empirical formula for the following data:

Marks	0-10	10-20	20-30	30-40	40-50	50-60
No.of students:	6	12	20	35	18	4

12. Find the Karl Pearson's coefficient of correlation for the following data:

X :	43	44	46	40	44	42	45	42	38	40	42	57
Y :	29	31	19	18	19	27	27	29	41	30	26	10

13. Ten fair coins were thrown simultaneously. Find the probability of getting (i) at least one head (ii) exactly five heads (iii) at most seven heads (iv) not more than four heads.
14. A random sample of 200 tins of coconut oil gave an average weight of 4.95 kgs with a standard of 0.21 kg. Do we accept the hypothesis of net weight 5 kgs per tin at 1% level?
15. If X has the probability density function
    $f(x) = 6x(1-x)$, $0 \le x \le 1$; $f(x) = 0$ otherwise,
    find mean and variance of X.
16. In a distribution exactly normal , 10.03% of the items are under 25 kg weight and 89.97% of the items are under 70 kg weight. What are mean and standard of the distribution?
17. Explain the components of time series.
18. Use graphical method to
    Maximize $z = 50x_1 + 60x_2$
    subject to
    $2x_1 + 3x_2 \le 1500$; $3x_1 + 2x_2 \le 1500$; $0 \le x_1 \le 400$; $0 \le x_2 \le 400$.

SECTION C

Answer any two questions: **(2x 20 = 40 Marks)**

19. A factory produces two types of electric bulbs A and B. In an experiment relating to their life , the following results were obtained.

Length of life(in hrs) :	500-700	700-900	900-1100	1100-1300	1300-1500
No.of bulbs(A) :	5	11	26	10	8
No.of bulbs(B) :	4	30	12	8	6

Compare the variability of the two varieties using the coefficient of variation.

20. Seven fair coins were tossed and the number of heads noted. The experiment was repeated 128 times and the following distribution was obtained.

No.of heads:	0	1	2	3	4	5	6	7
Frequency :	7	6	19	35	30	23	7	1

Fit a binomial distribution assuming (i) the coin is unbiased (ii) the nature of the coin is not known. Also test the goodness of fit at 5% level.

21. Calculate seasonal indices by the ratio-to moving average method from the following method:

	Year			
Quarter	1980	1981	1982	1983
Q_1	75	86	90	100
Q_2	60	65	72	78
Q_3	54	63	66	72
Q_4	59	80	85	93

22. Find the optimal solution to the following transportation problem:

	Destination				
Origin	D_1	D_2	D_3	D_4	Supply
O_1	23	27	16	18	30
O_2	12	17	20	51	40
O_3	22	28	12	32	53
Demand	22	35	25	41	
