LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

B.Com. DEGREE EXAMINATION – **COMMERCE**

SECOND SEMESTER – APRIL 2017

16UST2AL01- BUSINESS STATISTICS - II

Date: 27-04-2017 Dept. No. Max. : 100 Marks
01:00-04:00

SECTION A

Answer ALL questions. **(10 x 2 = 20 marks)**

1. Calculate harmonic mean for the following data:
   56 47 68 46 50
2. Define mean deviation.
3. State the properties of correlation coefficient.
4. What are the regression lines?
5. What are the components of time series?
6. Fit a trend line to the following data by Graphic Method:

Year	1980	1981	1982	1983	1984	1985
Production (in units)	45	50	48	60	55	70

7. Explain the nature of the operation research.
8. Define extreme point of the linear programming problem.
9. What is degeneracy and non-degeneracy of the transportation problem?
10. Using minimax criterion find the optimal strategies for the players in the players in the following game.

$$\begin{matrix} & \text{Player } B \\ \text{Player } A & \end{matrix} \begin{bmatrix} 12 & 1 & 30 & -10 \\ 20 & 3 & 10 & 5 \\ -5 & -2 & 25 & 0 \\ 15 & -4 & 10 & 6 \end{bmatrix}$$

SECTION B **(4X 10 = 40 Marks)**

Answer any FOUR questions

11. Calculate the mean, median and mode from the following data:

Marks	10–20	20–30	30–40	40–50	50–60	60–70	70–80	80–90
No. of students	5	7	10	12	14	9	7	5

12. Describe the various measures of dispersion.

13. Find coefficient of correlation for the following

Cost	39	65	62	90	82	75	25	98	36	78
sales	47	53	58	86	62	68	60	91	51	84

14. Fit a straight line trend by the method of least squares for the following data and estimate the production for the year 2005

Year	1996	1997	1998	1999	2000	2001	2002	2003
Production	38	40	65	72	69	60	87	95

15. Explain the Methodology used in Operations Research.

16. A machine producing either product A or B can produce A by using 2 units of chemicals and 1 unit of a compound and can produce B by using 1 unit of chemicals and 2 units of the compound. Only 800 units of chemicals and 1000 units of the compound are available. The profits available per unit of A and B are Rs.30 and Rs.20 respectively. Draw a suitable diagram to show the feasible region. Also, find the optimum allocation of units between A and B to maximize the total profit. Find the maximum profit.

17. Expain the applications of game theory.

18. using the principle of Dominance solve the following game

Player B

$$\text{Player A} \begin{bmatrix} -3 & -4 & 5 & 2 \\ 3 & 6 & 4 & 7 \\ 4 & 2 & 6 & -8 \end{bmatrix}$$

SECTION C **(2 X 20 = 40 Marks)**

Answer any TWO questions

19. Calculate the value of $\beta 1$ and β_2 from the following data and interpret them.

Wages(Rs .hundreds)	40–50	50–60	60–70	70–80	80–90
No. of workers	12	25	20	14	10

20. a) Two ladies were to rank seven different types of lipsticks. The ranks given by them are as follows

lipsticks	A	B	C	D	E	F	G
X	2	1	4	3	5	7	6
Y	1	3	2	4	5	6	7

Calculate spearman's rank correlation coefficient

b) In a partially destroyed laboratory record of an analysis of correlation data, the following results only are legible: Variance of X = 9 Regression equations 8x-10y+66= 0 and 40x-18y=214

Find i) Mean values of x and y
ii) Coefficient of correlation between x and y
iii) Standard deviation of y

(10+10)

21. a) Calculate the 4 yearly moving average for the following data and find the short-term fluctuations

Year	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
production	70	87	105	100	82	65	49	34	20	7

b). Obtain seasonal variation indices using the method of link relatives for the following data

Quarter	2011	2012	2013	2014	2015
I	45	48	49	52	60
II	54	56	63	65	70
III	72	63	70	75	84
IV	60	56	65	72	66

(8+12)

22. Obtain the initial basic feasible solution to the following Transportation problem by using a)North-west Corner method b)Least-Cost Entry Method c) Vogel's Approximation Method:

Source	Destination				Supply
	D1	D2	D3	D4	
S1	5	2	4	3	22
S2	4	8	1	6	15
S3	4	6	7	5	8
Demand	7	12	7	19	

(6+6 +8)

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