LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

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

SECOND SEMESTER – **APRIL 2015**

ST 2104 - BUSINESS STATISTICS

Date : 20/04/2015 Dept. No. Max. : 100 Marks

Time : 01:00-04:00

SECTION- A

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

1. Define statistics.
2. What are the measures of central tendency?
3. What do you mean by kurtosis?
4. Define regression.
5. The lines of regression of a bivariate distribution are as follows: 5X – 145 = -10Y, 14Y -208 = -8X. Find the means of X and Y.
6. Define correlation.
7. Define time series.
8. Define a Linear Programming Problem.
9. Define a two-person zero sum game.
10. Differentiate between a fair and strictly determinable game.

SECTION- B

Answer any FIVE questions. **(5 x 8 =40 marks)**

11. Discuss the applications of statistics.
12. Calculate mean and median from the following data:

Marks	10-20	20-30	30-40	40-50	50-60	60-70	70-80
No. of students	4	6	10	20	10	6	4

13. Determine Standard deviation and mean deviation from median for the data given below

Mark(X)	0-10	10-20	20-30	30-40	40-50	50-60
Frequency(f)	10	20	30	50	40	30

14. Calculate 5-yearly and 7-yearly moving average for the following data of a number of commercial industrial failures during 1992-2007.

Year	1992	'93	'94	'95	'96	'97	'98	'99
No. of failures	23	26	28	32	20	12	12	10
Year	2000	'01	'02	'03	'04	'05	'06	'07
No. of failures	9	13	11	14	12	9	3	1

15. Calculate Karl Pearson's coefficient of correlation between per capita national income(X) and per capita consumer expenditure(Y)(for 10 consecutive years) from the data given below:

X	249	251	248	252	258	269	271	272	280	275
Y	237	238	236	240	245	255	254	252	258	251

16. Data on Advertisement Expense and Sales are given below

Advertisement Expense(in lakhs)(X)	1	2	3	4	5
Sales(in lakhs) (Y)	10	20	30	50	40

Estimate Sales when Advertisement expense is equal to 5.2 lakhs.

17. A company manufactures 2 models of voltage stabilizers A and B. All components of the stabilizers are purchased from outside and only assembling and testing is carried out at the company. The assembly and testing time required for the two models are 0.8 hours each for A and 1.2 hours for B. Manufacturing capacity of 720 hours at present is available per week.

The market for the 2 models has been surveyed which suggests maximum weekly sales of 600 units of A and 400 units of B. Profit per unit for A and B models has been estimated at Rs.100 and Rs.150 respectively. Find the optimum product mix using graphical method.

18. a) Solve the game whose payoff matrix is given by

$$\begin{array}{c} \\ \textit{Player A} \end{array} \begin{array}{c} \textit{Player B} \\ \begin{bmatrix} 15 & 2 & 3 \\ 6 & 5 & 7 \\ -7 & 4 & 0 \end{bmatrix} \end{array}$$

b) Solve the game whose payoff matrix is given by

$$\begin{array}{c} \\ \textit{Player A} \end{array} \begin{array}{c} \textit{Player B} \\ \begin{bmatrix} -2 & 0 & 0 & 5 & 3 \\ 3 & 2 & 1 & 2 & 2 \\ -4 & -3 & 0 & -2 & 6 \\ 5 & 3 & -4 & 2 & -6 \end{bmatrix} \end{array}$$

SECTION - C

Answer any TWO questions. **(2 x 20 =40 marks)**

19. The following table gives the profits (Rs.'000s) of two companies for the last 10 years. Which of the two companies has greater consistency in profits?

Profit of Co.X	700	625	725	625	650	700	650	700	600	650
Profit of Co.Y	550	600	575	550	650	600	550	525	625	600

20. Compute the coefficient of correlation between dividends and prices of securities as given below:

Security Prices (Rs.)	**Annual Dividends (in 00's Rs.)**					
	6-8	8-10	10-12	12-14	14-16	16-18
130-140			1	3	4	2
120-130		1	3	3	3	1
110-120		1	2	3	2	
100-110		2	3	2		
90-100	2	2	1	1		
80-90	3	1	1			
70-80	2	1				

21. Calculate seasonal variations given the average quarterly price of a commodity for 5 years by ratio to trend method.

Year	I Quarter	II Quarter	III Quarter	IV Quarter
2001	28	22	22	28
2002	35	28	25	36
2003	33	34	30	35
2004	31	31	27	35
2005	37	36	31	36

22. There are three sources A, B, C which store a given product. These sources supply the product to four dealers D, E, F, G. The cost (Rs.) of transporting the products from various sources to various dealers, the capacities of the sources and the demands of the dealers are given below.

	D	**E**	**F**	**G**	**Supply**
A	6	8	8	5	**30**
B	5	11	9	7	**40**
C	8	9	7	13	**50**
Demand	**35**	**28**	**32**	**25**	**120**

Find out the solution for transporting the products at a minimum cost by using North-West corner rule, Least cost method and Vogel's Approximation Method.

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