LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

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

THIRD SEMESTER – **APRIL 2016**

ST 3104 - BUSINESS STATISTICS

Date: 06-05-2016 Dept. No. Max. : 100 Marks
Time: 09:00-12:00

SECTION A

Answer ALL the questions. **10 x 2 = 20 Marks)**

1. Write a note on misuse of statistics.
2. Define the term harmonic mean,
3. Calculate median for the following data:27,36,28,18,35,26,20,35,40,26
4. Define kurtosis.
5. Calculate mean deviation about mean for the following data:18,20,12,14,19,22,26,16,19,24
6. State any two properties of correlation coefficients.
7. What are the components of time series?
8. What are the uses of index numbers?
9. Define operations research.
10. State any two limitations of Linear Programming problem.

SECTION B

Answer any FIVE questions **(5 X 8 = 40 Marks)**

11.(a) Differentiate between classification and tabulation.
(b) Distinguish between primary data and secondary data.

12. Draw histogram and frequency polygon to present the following data :

Income(Rs.)	No. of employees	Income(Rs.)	No. of employees
4000-4499	21	6000-6499	62
4500-4999	32	6500-6999	43
5000-5499	52	7000-7499	18
5500-5999	105	7500-7999	9

13. Calculate the Harmonic Mean for the following data:

x	10	12	14	16	18	20
f	5	18	20	10	6	1

14. Find the Mean and Variance of the combined sample from the following data:

Sample	Mean	Variance	Size
I	85	16	70
II	96	25	30
III	100	36	60

15. Find the correlation coefficient between production and sales of a factory from the data given below:

Production (in tonnes)	50	55	63	67	65	60	61
Sales (in thousands)	35	36	42	51	54	53	55

16.Using four yearly moving averages, calculate the trend values and short term fluctuation:

Year	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Production	50	36.5	43	44.5	38.9	38.1	32.6	41.7	41.1	33.8

17. Calculate Laspeyre's Index number, Paasche's price index number and how it satisfies time reversal test.

Commodity	2005		2006	
	Price (in Rs.)	Quantity (in kgs.)	Price (in Rs.)	Quantity (in kgs.)
A	8	6	12	4
B	10	8	12	8
C	14	4	18	4
D	4	6	2	10
E	10	10	14	8

18. Use the graphical method to solve the following L.P problem.

Maximize $Z=20x+30y$

Subject to the constraints,

$3x + 3y \leq 36$

$5x + 2y \leq 50$

$2x + 6y \leq 60$

$x, y \geq 0$

SECTION C

Answer any TWO questions **(2 X 20 = 40 Marks)**

19.(a) From the following data find mean, median and mode. Verify the empirical relation.

Marks	0 – 10	10 – 20	20 – 30	30- 40	40 – 50	50 – 60	60 – 70	70 – 80	80 – 90
No.of students	4	5	9	15	20	7	5	9	6

(b) From the following data, find out which share is more stable in its value.

X	36	55	52	53	58	60	48	50	40	49
Y	108	107	105	105	102	108	104	103	107	101

(10 +10)

20. Calculate Karl Pearson's Coefficient of Skewness:

Marks	10 – 19	20 – 29	30 – 39	40 – 49	50 – 59	60 – 69	70 – 79	80 – 89
Frequency	5	9	14	20	25	15	8	4

(20)

21.The following table gives the aptitude test scores and productivity indices of 10workers selected at random:

Aptitude scores (X)	60	62	65	70	72	48	53	73	65	82
Productivity index (Y)	68	60	62	80	85	40	52	62	60	81

Find the two Regression Equations and estimate:

(b) the productivity index of a worker whose test score is 92

(ii) the test score of a worker whose productivity is 75 **(20)**

22.(a) The head of department has 5 jobs A,B,C,D and E and 5 subordinates V,W,X,Y and Z. The number of hours each man would take to perform each job is as follows:-

	V	W	X	Y	Z
A	16	13	17	19	20
B	14	12	13	16	17
C	14	11	12	17	18
D	5	5	8	8	11
E	5	3	8	8	10

How the jobs should be allocated to minimize the total time.

(b) A manufacturer has distribution centers X,Y and Z. These centers have 50,30 and 40 units of his product. His retail outlets at A,B,C,D and E require 35,20,25,40 and 25 units respectively. The transport cost in (Rs/unit) between each centre and each outlet is given in the following table.

RETAIL OUTLETS

Dist. Centre	A	B	C	D	E
X	25	30	42	45	40
Y	35	25	50	35	50
Z	45	50	55	55	60

Find initial basic feasible 2olution, (Use North-west corner rule from the initial solution). **(10 + 10)**

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