

# LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034



## B.Com. DEGREE EXAMINATION – COMMERCE

SECOND SEMESTER – APRIL 2018

### ST 2104 / BC 2104 – BUSINESS STATISTICS

Date: 28-04-2018  
Time: 01:00-04:00

Dept. No.

Max. : 100 Marks

#### Section A

Answer ALL the Questions. 10 x 2 = 20

1. Define Arithmetic mean. State any two of its merits.
2. Define Range and its coefficient.
3. Define Kurtosis.
4. The first four central moments of distribution are 0, 2.5, 0.7 and 18.75. Comment on the skewness and kurtosis of the distribution.
5. Define Correlation.
6. What are Regression Equations?
7. What are the three components involved in a linear programming problem?
8. What is a Transportation problem?
9. What do you mean by a Two-person Zero-sum Game?
10. Define Mixed Strategy.

#### Section B

Answer any FIVE questions. 5 x 8 = 40

11. Explain the various measures of central tendency.
12. Calculate mode for the following distribution:

Class Interval	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45
Frequency	3	6	10	20	15	5	4	2

13. Compute Quartile Deviation and its co-efficient from the following data:

Marks	10	20	30	40	50	60
No. of students	4	7	15	8	7	2

14. The Karl Pearson's co-efficient of skewness of a distribution is 0.32. The Standard deviation is 6.5 and Mean is 29.6. Find Mode.

15. Calculate Karl Pearson's co-efficient of correlation from the following data:

Marks in Commerce	48	35	17	23	47
Marks in Statistics	45	20	40	25	45

16. Explain the various components of Time Series.

17. Obtain an initial basic feasible solution to the following transportation problem, using least cost method:

	D <sub>1</sub>	D <sub>2</sub>	D <sub>3</sub>	D <sub>4</sub>	Supply
O <sub>1</sub>	1	2	3	4	6
O <sub>2</sub>	4	3	2	0	8
O <sub>3</sub>	0	2	2	1	10
Demand	4	6	8	6	24

Here, O<sub>i</sub> and D<sub>j</sub> denote the i<sup>th</sup> origin and j<sup>th</sup> destination respectively.

18. Use the property of dominance to find the optimal strategies for players A and B in the following game. Also, obtain the value of game:

Player B

B <sub>1</sub>	B <sub>2</sub>	B <sub>3</sub>	A <sub>1</sub>	}
Player A	A <sub>2</sub>	A <sub>3</sub>	6	
$\begin{bmatrix} 1 & 7 & 2 \\ 2 & 7 & 2 \\ 1 & 6 & 6 \end{bmatrix}$				

**Section C**

Answer any TWO questions.

**2 x 20 = 40**

19. a) Calculate Standard Deviation from the following data: **(8 marks)**

Marks	10	20	30	40	50	60
No. of Students	8	12	20	10	7	3

b) The following table shows the Age (X) and Weight (Y) of 8 persons:

Age(X)	23	33	36	20	27	25	37	35
Weight(Y)	60	63	68	55	57	58	70	65

Obtain the regression equation of Y on X and find the expected weight of a person who is 45 years old. **(12 marks)**

20. Calculate the seasonal indices by the ratio to moving average method, from the following data:

Year	1 <sup>st</sup> quarter	2 <sup>nd</sup> quarter	3 <sup>rd</sup> quarter	4 <sup>th</sup> quarter
2006	68	62	61	63
2007	65	58	66	61
2008	68	63	63	67

21. a) Explain the procedure to obtain an initial basic feasible solution of a transportation problem using North-West Corner Rule. **(8 marks)**

b) Obtain an initial basic feasible solution to the following transportation problem, using Vogel's

Approximation Method: **(12 marks)**

Warehouses	Stores				Availability
	I	II	III	IV	
A	5	1	3	3	34
B	3	3	5	4	15
C	6	4	4	3	12
D	4	-1	4	2	19
Requirement	21	25	17	17	80

22. a) Solve the following LPP by graphical method: **(10 marks)**

Maximize  $z = 3x + 5y$

Subject to the constraints:  $3x + 2y \leq 18$

$x \leq 4$

$y \leq 6$

and  $x \geq 0, y \geq 0$ .

b) Solve the following 2x4 game graphically: **(10 marks)**

		Player B			
B <sub>1</sub>	B <sub>2</sub>	B <sub>3</sub>	B <sub>4</sub>		
		A <sub>1</sub>	2	}	
Player A	A <sub>2</sub>	1	1		
$\begin{bmatrix} 1 & 0 & -2 \\ 0 & 3 & 2 \end{bmatrix}$					

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