

**MAI-1103**

Seat No. _____

B. C. A. (Sem. III) Examination**October / November - 2018****BCA - 303 : Statistics & Optimization Techniques**

Time : 3 Hours]

[Total Marks : 70

1 (a) Attempt the following questions : 6

- (1) Define : Mean
- (2) Define : Median
- (3) Define : Mode
- (4) _____ is an ideal average.
- (5) The value of S. D is always _____
- (6) Quartile divides a series into _____ equal parts.

(b) Attempt any two : 12

- (1) Calculate the mean, median and mode for the following data.

Observations :	1	2	5	6-10	10-20	20-30	30-50	50-70	70-100
Frequency :	3	4	10	23	20	20	15	3	2

- (2) Find standard deviation from the following.

Class	0-10	10-20	20-30	30-40	40-50	50-60	60-70
Frequency	2	6	12	16	22	18	14

- (3) The mean of the following distribution is 122.7, find the missing frequency.

Class	60-79	80-99	100-119	120-139	140-159	160-179
Freq.	7	4	?	18	5	5

2 (a) Do as directed : 5

- (1) The value of correlation coefficient is between _____ and _____
- (2) If $r = 0$, the two variables are _____
- (3) The value of r^2 lies between _____ and _____
- (4) Two regression line intersect each other at _____ and _____
- (5) If two variables are perfectly positively correlated, $r =$ _____

(b) Attempt any two : 12

- (1) Find the equation of regression line from the following data.

x	3	2	-1	6	4	-2	5	7
y	5	13	12	-1	2	20	0	-3

- (2) Find karl pearsn's co-efficient between X and Y.

X	27	38	13	24	6	19	15
Y	35	46	19	32	15	31	20

- (3) Find r using rank co-relation method.

x	70	75	80	30	60	25	50	35	58	80
y	20	33	15	60	44	65	36	56	42	15

3 (a) Do as directed : 6

- (1) Full form: PERT, CPM
- (2) Define term: Activity, Event
- (3) Define term: Slack variable, Surplus variable

(b) Attempt any **two** :

12

- (1) Describe the advantages of Linear Programming Techniques.
- (2) Solve the following L.P.P using graphical method.

$$\text{Max. } Z = 6x_1 + 8x_2$$

$$\text{Sub. To } 5x_1 + 10x_2 \leq 60$$

$$4x_1 + 4x_2 \leq 40 \text{ And } x_1, x_2 \geq 0$$

- (3) Draw a network diagram for the following activity.

Activity	A	B	C	D	E	F	G	H
Predecessor Activity	—	A	A	B	B, C	E	D, E	G

4 (a) Do as directed :

- (1) How assignment problem is a particular case of transportation problem? 2
- (2) What is unbalanced transportation problem? How can it be balanced? 3

(b) Attempt any **two** :

12

- (1) Obtain initial basic feasible solution for the given problem by LCM and NWCM.

	1	2	3	4	Supply
A	3	1	7	4	300
B	2	6	5	9	400
C	8	3	3	2	500
Demand	250	350	400	200	1200

- (2) Find initial basic feasible solution for given problem by using Vogel's method.

	<i>D</i>	<i>E</i>	<i>F</i>	<i>G</i>	<i>Supply</i>
<i>A</i>	11	13	17	14	250
<i>B</i>	16	18	14	10	300
<i>C</i>	21	24	13	10	400
<i>Demand</i>	200	225	275	250	950

- (3) Determine optimum solution by MODI method for following transportation problem.

	<i>S</i> ₁	<i>S</i> ₂	<i>S</i> ₃	<i>S</i> ₄	<i>Supply</i>
1	4	8	8	0	76
2	16	24	16	0	82
3	8	16	24	0	77
<i>Demand</i>	72	102	41	20	235