



**GAI-613**

Seat No. \_\_\_\_\_

**B. C. A. (Sem. III) Examination**

**November / December - 2015**

**BCA-303 : Statistical &  
Optimization Techniques**

Time : 3 Hours]

[Total Marks : 70

- 1 [A] (1) Write a short note on 'Merits and Demerits of arithmetic mean'. 3

- (2) The mean of marks in statistics of 100 students in a class was 72. The mean of marks of boys was 75, while their number was 70. Find out the mean marks of girls in the class. 3

- (3) Following is the distribution of marks in law obtained by 50 students : 3

Marks (more than)	0	10	20	30	40	50
No. of Students	50	46	40	20	10	03

Calculate the Median marks.

- [B] (1) Calculate the mode from following data by the empirical formula : 5

Marks (below)	10	20	30	40	50	60	70	80	90
No. of Students	4	6	24	46	67	86	96	99	100

- (2) Find the value of mode from the data given below : 4

Weight (in kg)	103 - 107	108 - 112	113 - 117	118 - 122	123 - 127	128 - 132
No. of Persons	3	6	12	17	14	6

- 2 [A] (1) List the properties of correlation coefficient. 3

- (2) Calculate the correlation coefficient  $r(x, y)$  from the following data : 3

$$n = 10, \sum x = 140, \sum y = 150, \sum (x - 10)^2 = 180,$$

$$\sum (y - 15)^2 = 215, \sum (x - 10)(y - 15) = 60.$$

- (3) The ranks of the same 15 students in two subjects A & B are given below : 3

Rank in A	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Rank in B	10	7	2	6	4	8	3	1	11	15	9	5	14	12	13

Use Spearman's formula to find Rank correlation coefficient.

- [B] (1) Calculate the Karl Pearson's coefficient of correlation from the data given below : 5

Marks	Age in years				
	18	19	20	21	22
20 - 25	3	2	-	-	-
15 - 20	-	5	4	-	-
10 - 15	-	-	7	10	-
5 - 10	-	-	-	3	2
0 - 5	-	-	-	3	1



- (2) From the following data, obtain the Regression coefficient of  $y$  on  $x$  : 3

$x$	91	97	108	121	67	124	51	73	111	57
$y$	71	75	69	97	70	91	39	61	80	47

- 3 [A] (1) Give the full form of LPP, PERT & CPM. 3

- (2) Min.  $Z = x_1 - 3x_2 + 2x_3$  by Simplex method 6

Subject to,  $3x_1 - x_2 + 3x_3 \leq 7$

$$-2x_1 + 4x_2 \leq 12$$

$$-4x_1 + 3x_2 + 8x_3 \leq 10; x_1, x_2, x_3 \geq 0$$

- [B] (1) Solve the following LPP by Graphically 5

$$\text{Max. } Z = 8000x_1 + 7000x_2,$$

Subject to,  $3x_1 + x_2 \leq 66$

$$x_1 + x_2 \leq 45$$

$$x_1 \leq 20$$

$$x_2 \leq 40, x_1, x_2 \geq 0$$

- (2) Describe the 'Advantages of Linear Programming Techniques'. 4

- 4 [A] (1) Summarize the steps of computational procedure for obtaining an optimal assignment by 'Hungarian Assignment Method'. 6

- (2) Determine an IBF for following TP using NWCR : 3

	$D_1$	$D_2$	$D_3$	$D_4$	Supply
$O_1$	6	4	1	5	14
$O_2$	8	9	2	7	16
$O_3$	4	3	6	2	5
Demand	6	10	15	4	

- [B] (1) Determine optimum solution by MODI method for following T.P. : 6

		Market				
		<i>I</i>	<i>II</i>	<i>III</i>	<i>IV</i>	Supply
Ware House	<i>A</i>	5	2	4	3	22
	<i>B</i>	4	8	1	6	15
	<i>C</i>	4	6	7	5	8
Requirement		7	12	17	9	

- (2) Obtain IBF for following T.P. by Matrix-Minima method : 2

	$D_1$	$D_2$	$D_3$	$D_4$	Capacity
$O_1$	1	2	3	4	6
$O_2$	4	3	2	0	8
$O_3$	0	2	2	1	10
Demand	4	6	8	6	