(Please write your Exam Roll No.) Exam Roll No. 03021402013

END TERM EXAMINATION

THIRD SEMESTER [BCA] DECEMBER-2014

Paper Code: BCA201 **Subject: Mathematics-III (Batch: 2011 onwards)**

Time : 3 Hours **Maximum Marks :75**

Note: Attempt any five questions including Q.no.1 which is compulsory. Select one question from each unit.

Q1 (a) The mean weight of 150 students in a certain class is 60kg. The mean weight of boys in the class is 70kg and that of the girls is 55 kg. Find the number of boys and number of girls in the class.

(b) The means of 5 observations is 4.4 and variance is 8.24. If three of the five observations are 1,2 and 6, find the other two.

(c) Karl Pearson's coefficient of skewness of a distribution is 0.32, its standard deviation is 6.5 and mean is 29.6, find the mode of the distribution.

(d) Solve the following linear programming problem by Graphical method:
Max $z = 5x_1 + 4x_2$, s.t. $x_1 - 2x_2 \le 1$, $x_1 + 2x_2 \ge 3$, $x_1, x_2 \ge 0$.

(e) Find the two lines of regression and coefficient of correlation for the data given below:
$n = 18$, $\sum x = 12$, $\sum y = 18$, $\sum x^2 = 60$, $\sum y^2 = 96$, $\sum xy = 48$. **(5x5=25)**

UNIT-I

Q2 (a) For the following data, calculate mean, median and mode:- **(6)**

Class	93-97	98-102	103-107	108-112	113-117	118-122	123-127	128-132
Frequency	2	5	12	17	14	6	3	1

(b) Draw a histogram of the following data:- **(6.5)**

Class	2-5	5-11	11-12	12-14	14-16
Frequency	7	3	5	2	4

Q3 (a) Compute the quartile deviation and standard deviation of the following:- **(6)**

Class	100-109	110-119	120-129	130-139	140-149	150-159
Frequency	10	33	41	35	15	16

(b) For the following data draw ogives: **(6.5)**

Class	10-14	15-19	20-24	25-29	30-34
Frequency	6	10	11	12	11

UNIT-II

Q4 (a) Calculate the correlation coefficient from the following data:- **(6)**

x / y	0-10	10-20	20-30
0-6	3	2	1
6-12	0	4	2
12-18	5	0	3
18-24	1	3	0

(b) Ten participants in a context are ranked by two judges as follows:- **(6.5)**

x	1	6	5	10	3	2	4	9	7	8
y	6	4	9	8	1	2	3	10	5	7

Calculate the rank correlation coefficient.

P.T.O.

BCA-201
P1/2

Q5 (a) Two random variables have the regression lines with equations $3x+2y=26$ and $6x+y=31$. Find the mean value and the correlation coefficient between x and y. **(6)**

(b) If the coefficient of correlation between two variables x and y is 0.5 and the acute angle between their lines of regression is $\tan^{-1}(3/8)$, show that $\sigma_x = \frac{1}{2}\sigma y$. **(6.5)**

UNIT-III

Q6 (a) Use the Big-M method to solve the following problem:- **(6)**

Min $Z = 8x_1 + 9x_2$, s.t. $x_1 - 3x_2 \le 2$, $x_1 + x_2 \ge 6$, $x_1, x_2 \ge 0$.

(b) Write the dual of the following problem:- **(6.5)**

Min $Z = 2x_1 + 3x_2 + 4x_3$

s.to $2x_1 + 3x_2 + 5x_3 \ge 2$, $3x_1 + x_2 + 7x_3 = 3$, $x_1 + 4x_2 + 6x_3 \le 5$, $x_1, x_2, x_3 \ge 0$.

Q7 A branch of Punjab National bank has only one typist. Since the typing work varies in length, the mean service rate 8 letters/hr. The letters arrive at a rate of 5/hour during the entire 8hours work day. If the typewriter is valued at 1.50/- Rs. Per hour, determine-

(a) The equipment utilization.
(b) The percent time that an arriving letter has to wait.
(c) The average system time.
(d) The average cost due to waiting on the part of the type writer. **(12.5)**

UNIT-IV

Q8 A company is faced with the problem of assigning four machines to six different jobs. The profits are estimated as follows. Solve the problem to maximize the total profit. **(12.5)**

Machines / Job	A	B	C	D
1	3	6	2	6
2	7	1	4	4
3	3	8	5	8
4	6	4	3	7
5	5	2	4	3
6	5	7	6	4

Q9 Solve the following transportation problem and test for optimality to find the optimal solution. **(12.5)**

	D_1	D_2	D_3	D_4	D_5	Capacity
O_1	12	4	9	5	9	55
O_2	8	1	6	6	7	45
O_3	1	12	4	7	7	30
O_4	10	15	6	9	1	50
Requirement	40	20	50	30	40	

****

BCA-201
P2/2