(Please write your Exam Roll No.) Exam Roll No. 05781202011

END TERM EXAMINATION

THIRD SEMESTER [BCA] DECEMBER-2012

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Paper Code: BCA201 Subject: Mathematics

(Batch: 2011)

Time : 3 Hours Maximum Marks :75

Note: Attempt any five questions.

Q1 (a) Solve maximize $z = 4x_1 + 5x_2$,

Subject to $6x_1 + 5x_2 \le 250$, $4x_1 + 6x_2 \le 200$, $6x_1 + 5x_2 \ge 150$, $9x_1 + 5x_2 \ge 130$, $x_1, x_2 \ge 0$. **(7)**

(b) Use Simplex Method to solve the following L.P.P.:-

Max $z = 4x_1 + 10x_2$,

subject to $2x_1 + x_2 \le 50$, $2x_1 + 5x_2 \le 100$, $2x_1 + 3x_2 \le 90$, $x_1 \ge 0$ and $x_2 \ge 0$. **(8)**

Q2 (a) Solve the following L.P.P.;- **(8)**

Max $z = 5x_1 - 4x_2 + 3x_3$,

subject to $2x_1 + x_2 - 6x_3 = 20$, $6x_1 + 5x_2 + 10x_3 \le 76$, $8x_1 - 3x_2 + 6x_3 \le 50$, x_1, x_2, $x_3 \ge 0$.

(b) Use duality to solve the following L.P.P.:-

Max $z = 2x_1 + x_2$,

Subject to constraints: $x_1 + 2x_2 \le 10$, $x_1 + x_2 \le 6$, $x_1 - x_2 \le 2$, $x_1 - 2x_2 \le 1$, $x_1, x_2 \ge 0$. **(7)**

Q3 (a) National Oil Company (NOC) has three refineries and four depots. Transporation cost per ton, capacities and requirements are given below:-

	D_1	**D_2**	**D_3**	**D_4**	**Capacity (tons)**
R_1	5	7	13	10	700
R_2	8	6	14	13	400
R_3	12	10	9	11	800
Requirement	**200**	**600**	**700**	**400**	

Determine optimal allocation of output. **(8)**

(b) If the matrix elements represent the unit transporation times, solve the following transporate problem:- **(7)**

	To				
From	**D_1**	**D_2**	**D_3**	**D_4**	**Available**
O_1	10	0	20	11	15
O_2	1	7	9	20	25
O_3	12	14	16	18	5
Required	**12**	**8**	**15**	**10**	**45**

Q4 (a) Solve the following assignment problems:- **(8)**

$$\begin{array}{c} \\ I \\ II \\ III \\ IV \end{array} \begin{array}{c} \begin{array}{cccc} A & B & C & D \end{array} \\ \begin{bmatrix} 1 & 4 & 6 & 3 \\ 9 & 7 & 10 & 9 \\ 4 & 5 & 11 & 7 \\ 8 & 7 & 8 & 5 \end{bmatrix} \end{array}$$

P.T.O.

(b) Solve the following assignment problems:-

	A	B	C	D	E
1	62	78	50	101	82
2	71	84	61	73	59
3	87	92	111	71	81
4	48	64	87	77	80

Q5 (a) Give that the median value is 46, find the missing frequencies for the following incomplete frequency distribution:- **(7)**

Class	10-20	20-30	30-40	40-50	50-60	60-70	70-80	Total
f	12	30	-	65	-	25	18	229

(b) Determine mean, median, mode for the following data:- **(8)**

Mid value	15	20	25	30	35	40	45	50	55
Frequency	2	22	19	14	3	4	6	1	1
Cum *f*	2	24	43	57	60	64	70	71	72

Q6 (a) The score obtained by two batsmen A and B in 10 matches are follows:- **(6)**

A	30	44	66	62	60	34	80	46	20	38
B	34	46	70	38	55	48	60	34	45	30

Determine who is more consistent.

(b) Explain with examples the following:- **(9)**
(i) Quartile (ii) Deciles (iii) Percentiles

Q7 (a) Determine Pearson's Coefficients of correlation for the following data:- **(8)**

X	150	148	148	152	154
Y	65	64	63	65	67

(b) Two random variable have the regression lines with equation $3x+2y=26$ and $6x+y=31$. Find the mean values and the angles between these lines. **(7)**

Q8 (a) Find the equation of the lines of regression based on the following data:- **(7)**

x	4	2	3	4	2
y	2	3	2	4	4

(b) A T.V. repairman finds that the time spent on his jobs has an exponential distribution with mean 30 minutes. If he repairs sets in the order in which they came in and if the arrival of sets is approximately Poisson with an average rate of 10 per 8 hour day. What is repairman's expected idle time each day? How many jobs are ahead of the average set just brought in? **(8)**

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