Examination May-2014

B.C.A.

Operations Research

SUBJECT CODE: BC-504

Paper I.D : [B0222]

Time: 03 Hours

Maximum marks :60

Instructions to candidates:

1.   Section –A is compulsory.
2.   Attempt any four questions from Section-B.

SECTION -A

Q.1. Write short notes on the following:

a)   Optimum solution
b)   Infeasible solution
c)   Degeneracy in transportation Problem and how is it removed
d)   Pay Off Table
e)   Maximin Criterion
f)   Decision making under Uncertainty
g)   Expected Value of Perfect Information
h)   Difference between Transportation Problem and Assignment Problem
i)   Methods of Integer Programming
j)   Characteristics of Dynamic Programming   2x10=20

SECTION –B

Q.2. Discuss the meaning, significance and scope of Operations Research. (10)

Q.3.Solve the following LP problem using Simplex Method

Minimise $Z= 5x+3Y$

Subject to: $2x+4Y \leq 12$

$5x+2Y \geq 10$

$2x+3Y =10$

$X,Y \geq 0$ (10)

Q.4 A company has three factories at A,B and C which supply to warehouses at D, E, F and G respectively. Monthly production capacities of these factories are 250,300 and 400 respectively. If overtime production is utilised, factories A and B can produce 50 and 75 additional units with an incremental cost of Rs.4 and Rs.5 respectively. The current warehouse requirements are 200,225,275 and 300 units respectively. The unit transportation costs in rupees from factories to warehouses are as follows:

From\To	D	E	F	G
A	11	13	17	14
B	16	18	14	10
C	21	24	13	10

Determine the optimum distribution for this company to minimise cost.   (10)

Q.5. The marketing director of a company is faced with a problem of assigning 5 senior managers to 6 zones. The efficiency indices of different managers are given below:

Managers\Zones	I	II	III	IV	V	VI
A	73	91	87	82	78	80
B	81	85	69	76	74	85
C	75	72	83	84	78	91
D	93	96	86	91	83	82
E	90	91	79	89	69	76

Find out which zone will be managed by a junior manager due to non availability of a senior manager.   (10)

Q.6. A television finds that the cost of a T.V. in stock for a week is Rs. 30 and the cost of a unit shortage is Rs.70.The probability distribution of weekly sales is as follows:

Weekly sales	0	1	2	3	4	5	6
Probability	0.1	0.1	0.2	0.25	0.15	0.15	0.05

How many units per week should the dealer order?   (10)

Q. 7. Use Branch and Bound technique to solve the following integer programming problem :

Maximise $Z = 7X + 9Y$

Subject to :

$$-X + 3Y \leq 6$$
$$7X + Y \leq 35$$
$$Y \leq 7$$

X and Y are integers.   (10)

————— End —————