Roll No. ....

BBA–406(N)

B. B. A. (Fourth Semester)
EXAMINATION, May, 2013

(New Course)

Paper Sixth

OPERATIONS RESEARCH

Time : Three Hours]   [*Maximum Marks : 70*

Note : Attempt all the *five* questions. All questions carry equal marks.

1. Discuss the concept and importance of operations research.

<p style="text-align:center">*Or*</p>

What is a Model ? What are its components ? Also mention application of *or* model in business.

2. Solve the L. P. problem graphically.

Maximize :

$$z = 80x_1 + 100x_2$$

Subject to :

$$x_1 + 2\,x_2 \leq 720$$
$$5\,x_1 + 4\,x_2 \leq 1800$$
$$3\,x_1 + x_2 \leq 900$$

and $x_1, x_2 \geq 0$.

<p style="text-align:center">*Or*</p>

Apply Simplex method to solve the following L. P. problem.

Maximize :

$$Z = 30\, x_1 + 23\, x_2 + 29\, x_3$$

Such that :

$$6\, x_1 + 5\, x_2 + 3\, x_3 \leq 26$$
$$4\, x_1 + 2\, x_2 + 5\, x_3 \leq 7$$

and $x_1, x_2, x_3 \geq 0$.

3. Determine an initial basic feasible solution of the following problem using Vogel's approximation method. Also test for optimality by MODI method.

Sources	Destination				Supply
	1	2	3	4	
1	21	16	15	3	11
2	17	18	14	23	13
3	32	27	18	41	19
Demand	6	10	12	15	43

Or

The following matrix shows the profit earned by 3 sales persons in ₹ P_1, P_2, P_3 when they work in there different sales zones Z_1, Z_2, Z_3 respectively

Person	Zone		
	Z_1	Z_2	Z_3
P_1	10	15	7
P_2	16	9	13
P_3	12	8	6

Find which salesperson should be assigned which sales Zone so that profit be maximum. Also work out the profit.

4. Explain the concept of Game Theory. What are various principles involved in solution ? Also explain the dominance principle in games with appropriate example.

Or

Reduce the following game by dominance and find the value of game :

		Player B			
		I	II	III	IV
Player A	I	3	2	4	0
	II	3	4	2	4
	III	4	2	4	0
	IV	0	4	0	8

5. A contractor identifies 12 tasks (A, B, C.......L) in a project with the following precedence restrictions :

Tasks	Pre task	Time (duration)
A	—	30
B	—	7
C	A	10
D	B, C	14
E	D	10
F	E	7
G	B, C	21
H	F, G	7
I	F, G	12
J	H, I	15
K	B	30
L	F, G, K	15

(a) Draw the network diagram.

(b) Find critical path.

Or

Point out the differences between CPM and PERT. Explain how "slack" is calculated in PERT approach.

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1,900