BBA–406(N)

B. B. A. (Fourth Semester)
EXAMINATION, May/June, 2015

(New Course)

Paper Sixth

OPERATIONS RESEACH

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

Note : Section A is compulsory. Attempt four more questions selecting *two* questions each from Section B and Section C.

Section—A   3 each
(Short Answer Type Questions)

1. (A) What are the advantages of operations research models ?

   (B) Give the various general methods of solutions for OR models.

   (C) What do you mean by Artificial variable technique ?

   (D) What are the application areas of linear programming ?

   (E) Describe methods to obtain an initial feasible solution for a transportation problem.

(F) Give an algorithm to solve an assignment problem.

(G) What are various criteria used for decision-making under uncertainty ?

(H) What do you mean by EMV and EOL ? Give example.

(I) Distinguish between PERT and CPM.

(J) What are the various time estimate for PERT ? Discuss.

Section—B
(Long Answer Type Questions)
10 each

2. What is meant by Operation Research ? Explain the importance of O. R. in decision-making.

3. Solve the following L. P. P. graphically :

Maximize :

$$z = x_1 + x_2$$

Subject to constraints :

$$x_1 + 2x_2 \leq 2000$$
$$x_1 + x_2 \leq 1500$$
$$x_2 \leq 600$$

and $x_1, x_2 \geq 0.$

4. Solve the following L. P. P. by using Simplex method.

Maximize :

$$z = 2x_1 + 5x_2 + 7x_3$$

Subject to :

$$3x_1 + 2x_2 + 4x_3 \leq 100$$
$$x_1 + 4x_2 + 2x_3 \leq 100$$
$$x_1 + x_2 + 3x_3 \leq 100$$

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

5. Determine the transportation cost using VAM.

Pit	A	B	C	Supply
Project Location				10
X	4	8	8	76
Y	16	24	16	82
Z	8	16	24	77
Demand	72	102	41	235

Section—C
(Long Answer Type Questions)
10 each

6. Solve the following transportation problem and test its optimality :

Plant	Project			Plant Capacity
	A	B	C	
X	4	18	15	60
Y	14	24	10	85
Z	16	10	8	75
Project Requirement	75	100	45	220

7. Consider the problem of assigning five jobs to five persons. The assignment costs are given as follows : 10

Job

		1	2	3	4	5
	A	8	4	2	6	1
	B	0	9	5	5	4
Person	C	3	8	9	2	6
	D	4	3	1	0	3
	E	9	5	8	9	5

Determine the optimum assignment schedule.

8. A newspaper boy has the following probabilities of selling a magazine :

No of copies sold	Probability
10	0.10
11	0.15
12	0.20
13	0.25
14	0.30

Cost of copy is 30 paise and sale price is 50 paise. He cannot return unsold copies :

(i) How many copies should he order by EMV criterion ?

(ii) How many copies should he order by EOL criterion ?

Activity	Preceding Activity	Duration
A	None	42
B	None	21
C	A	35
D	A	28
E	A	21
F	C	21
G	D	35
H	B, D, E	35
I	H	14
J	1, G, F	21

(a) Draw the network diagram and find critical path and its duration.

(b) Earliest, latest : start and finishs times.

(c) Total, free and independent floats of activity.