

or is an experimental and applied
science devoted to obtaining
and which is devoted to obtain
use man machine - system
or workers are actually engaged

Roll No. 0201857

BBA-406(N)

B. B. A. (Fourth Semester)
EXAMINATION, May, 2019

(New Course)

Paper Sixth

OPERATIONS RESEARCH

Time : Three Hours] [Maximum Marks : 70

Note : Attempt questions from all Sections as directed.

Inst. : The candidates are required to answer only in
serial order. If there are many parts of a question,
answer them in continuation.

Section—A

(Short Answer Type Questions)

Note : All questions are compulsory. Each question carries
3 marks.

1. (A) What are Operations Research techniques ?
- (B) What do you understand by L. P. P. ?
- (C) What is "Degeneracy" ?
- (D) Draw the graphs of the following inequations :

(i) $x_1 + 2x_2 \leq 32$

(ii) $x_1 + x_2 \leq 24$

(B-9) P. T. O.

[2]

BBA-406(N)

- (E) What are the steps of VAM, method of solving Transportation problems ?
- (F) Discuss the limitations of O. R.
- (G) Give an algorithm to solve an assignment problem.
- (H) Write short notes on the following :
- (i) EOL criterion
- (ii) EMV criterion
- (I) What is dummy activity ? Why is it used ?
- (J) Explain *three* time estimates in PERT with suitable example.

Section—B

(Long Answer Type Questions)

Note : Attempt any *two* questions. Each question carries 10 marks.

2. What are the advantages and disadvantages of O. R. Models ? Why is it necessary to test models ? How would you test models ?
3. Solve the following L. P. P. Graphically :

Minimize :

$$z = 20x_1 + 40x_2$$

Subject to constraints :

$$36x_1 + 6x_2 \geq 108$$

$$3x_1 + 12x_2 \geq 36$$

$$20x_1 + 10x_2 \geq 100$$

and $x_1, x_2 \geq 0$.

[3]

BBA-406(N)

4. Solve the given L. P. P. by Simplex method :
- Maximize :

$$z = 2x - 3y + z$$

Subject to constraints :

$$3x + 6y + z \leq 6$$

$$4x + 2y + z \leq 4$$

$$x - y + z \leq 3$$

and $x \leq 0, y \geq 0, z \geq 0$.

5. Solve the following Transportation problem for its optimality :

From \ Source	Destinations			Available
	A	B	C	
I	50	30	220	2
II	90	45	170	6
III	250	200	50	8
Requirement	8	4	4	16

Section—C

(Long Answer Type Questions)

Note : Attempt any *two* questions. Each question carries 10 marks.

6. Determine the optimum assignment schedule and minimum cost for the given problem ahead :

(B-9)

(B-9) P. T. O.

Tasks	Men			
	E	F	G	H
A	18	26	17	11
B	13	28	14	26
C	38	19	18	15
D	19	26	24	10

7. The pay off for combination of three states of nature E_1, E_2 and E_3 and four acts A_1, A_2, A_3, A_4 are given in table :

Events	Payoff Table (₹)			
	A_1	A_2	A_3	A_4
E_1	4000	7000	8000	12000
E_2	4000	5800	6000	5000✓
E_3	4000	1500	2200	2000

Which acts should be selected on the basis of the following decision criteria :

- Maximin criterion.
- Maximax criterion. ✓
- Minimax regret criterion.
- Hurwitz criterion assuming coefficient of optimism as 0.6.
- Laplace criterion

8. A project schedule has the following characteristics :

Activity	Time (days)
1-2	2
1-4	2
1-7	1
2-3	4
3-6	1
4-5	5
4-8	8
5-6	4
6-9	3
7-8	3
8-9	5
9-10	2

Find the critical path, total duration and floats for each activity.

9. Write short notes on the following :
- Maximin and Minimax criteria
 - C. P. M. and PERT

