BCA 402

B.C.A. (PART-II) EXAMINATION, 2024-25

5489

(Fourth Semester)

Paper : II

BCA-402 : Operation Research

Time : Three Hours] [Maximum Marks : 70

Note: (i) Answer **Five** Questions in all.

(ii) Question No.-**1** is **Compulsory**.

(iii) Answer remaining **four** questions, selecting **two** questions from each Section **A** and **B.**

(iv) All questions carry equal marks.

(v) Symbols have their usual meaning.

1. Answer all parts of the following :

(a) Discuss the various phases in solving an OR problem.

(b) What is meant by Transportation problem.

(c) Explain the difference between a transportation problem and an assignment problem.

(d) What is critical path ?

Section-A

2. Explain the concept scope and tools of OR as applicable to business and industry.

3. Solve the following L.P.P by using graphical method :

Max $Z = 6x + 11y$

Subject to Constraints

$$2x + y \leq 104$$

$$x + 2y \leq 76$$

and $x, y \geq 0$

4. A firm own facilities at six places. It has manufacturing plants at places A, B and C with daily product of 50, 40 and 60 Units respectively. At point D, E and F it has three warehouses with daily demands of 20, 95 and 35 Units respectively. Per Unit shipping Costs are given in the following table. If the firm wants to minimize its total transportation cost, how should it route its products ?

Plant	Ware House		
	D	E	F
A	6	4	1
B	3	8	7
C	4	4	2

5. Solve the following game ;

$$A \begin{matrix} \\ I \\ II \\ III \end{matrix} \begin{matrix} B \\ I \quad II \quad III \end{matrix} \begin{bmatrix} -3 & -2 & 6 \\ 2 & 0 & 2 \\ 5 & -2 & -4 \end{bmatrix}$$

And give arithmetic method for the solution of 2×2 game.

Section-B

6. (a) Give a mathematical formulation of a transportation problem.

(b) Solve the following minimal assignment problem;

	I	II	III	IV
A	1	4	6	3
B	9	7	10	9
C	4	5	11	7
D	8	7	8	5

7. (a) Define the following :

(i) Competitive Game

(ii) Pay-off matrix

(b) Solve the following game ;

		B		
		I	II	III
A	I	6	8	6
	II	4	12	2

8. (a) Write short notes on PERT and CPM Techniques.

(b) A certain project is composed of nine activities where time estimates. are given below :

Activity	Expected duration (Week)		
	Optimistic	Most likely	Pessimistic
1-2	1	1	7
1-3	3	5	7
1-4	2	2	8
2-5	1	1	1
3-5	3	6	9
4-6	2	5	8
5-6	4	6	14
5-7	3	7	11
6-7	6	8	10

9. Write notes on any two of the following :

(a) Nature and definition of OR.

(b) Unbalanced assignment problem.

(c) Dominance property in Game theory.

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