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Class – B.Com (Prof.) Semester-IV
Subject – Operations Research
Paper – BCP-406

Time Allowed : 3 Hours   Maximum Marks : 50

Note :   Graph will be provided on damand.

SECTION-A

Attempt any 10 questions. Each question carries 1 mark.

1. (a)   What is Operations Research?

    (b)   Linearity in LPP.

    (c)   Differentiate between unbounded and Infeasible solution.

    (d)   Travelling Salesmen Problem.

    (e)   What is an Assignment Problem? Give two areas of its application.

    (f)   Write limitations of Game Theory.

    (g)   What do you mean by fair game?

    (h)   What is total elapsed time?

    (i)   Write down assumptions of a sequencing model.

    (j)   Define an Artificial Variable and write its importance.

    (k)   Principles of Dominance

    (l)   Saddle Point

SECTION-B

Attempt any Two questions. Each question carries 10 marks.

2. What are the important techniques used in Operations Research? Explain their limitations.

(10)

3. (a) What do you mean by Linear Programming Problem? Give applications of Linear Programming methods.

(b) Solve graphically

Min $Z = 6x_1 + 14x_2$

Sub to

$$5x_1 + 4x_2 \geq 60$$

$$x_1 + 2x_2 = 18$$

$$3x_1 + 7x_2 \leq 84$$

Where x_1 & $x_2 \geq 0$ (5, 5)

4. Use simplex method to solve following LPP

Max $Z = 3x_1 + 2x_2 + x_3$

Sub to

$$-3x_1 + 2x_2 + 2x_3 = 8$$

$$-3x_1 + 4x_2 + x_3 = 7$$

Where $x_1, x_2, x_3 \geq 0$ (10)

5. (a) Describe the method of drawing minimum number of lines in the context of assignment problem.

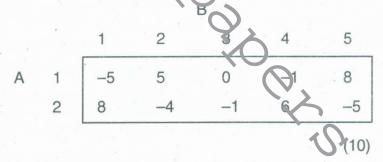(b) Solve the following travelling salesman problem so as to minimise the cost per cycle

	A	B	C	D	E
A	–	3	6	2	3
B	3	–	5	2	3
C	6	5	–	6	4
D	2	2	6	–	6
E		3	4	6	–

(5,5)

SECTION-C

Attempt any Two questions. Each question carries 10 marks.

6. Solve the following game

B

		1	2	3	4	5
A	1	–5	5	0	–1	8
	2	8	–4	–1	6	–5

(10)

7. (a) What is no passing rule in sequencing Problem? Illustrate it with help of suitable example.

(b) Find the sequence for the following eight jobs that will minimize the total elapsed time for completion of all the jobs. Each job is processed in the same order CAB.

TIME (HOURS)

Jobs	1	2	3	4	5	6	7	8
Times A	4	6	7	4	5	3	6	2
on Machines B	8	10	7	8	11	8	9	13
C	5	6	2	3	4	9	15	11

(5, 5)

8. (a) What do you mean by Game Theory? Give essential features of game theory along with its significance.

   (b) Solve the game

Firm B	B_1	B_2	B_3	B_4
A_1	35	35	25	5
A_2	30	20	15	0
A_3	40	50	0	10
A_4	55	60	10	15

Firm A

(5, 5)

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