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B.C.A. (IV-Semester) Examination, 2022

Paper: Third

(BCA-403)

(Optimization Techniques)

Time : Three Hours / / *Maximum Marks : 70*

Note : Attempt all sections as per instructions

Section-A

(Very Short Answer Type Questions)

Note : Attempt all parts of this question. Give answer of each part in about 50 words.

10×1½=15

1. (i) Define Topology

   (ii) What is ISDM

   (iii) Explain Basic Variables

P.T.O.

   (iv) Define feasible Region.

   (v) What is linear Programming.

   (vi) What is Transportation Model.

   (vii) Explain n jobs through m Machine.

   (viii) What is degenerate solution.

   (ix) What is Dual Problem.

   (x) What is Recursive Equation.

Section-B

(Short Answer Type Questions)

Note : Attempt all questions. Give answer of each question in about 200 words.

7×5=35

2. Solve the following with graphical method.

   Max $Z = 3x + 2y$

   Subject to: →

   $$5x + 4y \leq 20$$

   $$4x + 5y \leq 20$$

   $$X, Y \geq 0$$

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OR

What is conomical and standard form of LPP.

3. Apply the VAM technique on following Metrix.

From \ To	S1	S2	S3	Supply
P1	10	12	8	100
P2	15	32	16	200
P3	10	11	9	300
Demand	150	250	300	

OR

Solve the following Assignment Problem

		person		
	A	B	C	D
I	5	3	2	8
II	7	9	2	6
Jobs III	6	4	5	7
IV	5	7	7	8

4. Write down the steps for Conversion of Dynamic Programming into Linear Programming Problem. Support your answer with example.

OR

Write down the steps used for finding the optimal solution of Dynamic Programming.

5. What is unbalanced Transportation Problem. Apply the North West corner Rule for the following Transportation Problem.

Demand \ Supply	S_1	S_2	S_3	Supply
D_1	5	6	7	100
D_2	8	9	0	100
D_3	3	2	1	150
D_4	5	3	5	200
Demand	250	150	100	

OR

Write down the differences between PERT and CPM. Draw the Network diagram and Compute the Critical Path.

Activity	Optimistic	Most likely	Pessimistic
1-2	3	6	9
1-3	10	12	14
1-4	20	25	30
2-5	15	20	20
2-6	7	10	10
3-6	3	4	5
4-7	6	7	8
5-7	10	12	12
6-7	5	6	8

6. Write down the dual of following and then solve it

$$Max\ Z = 7x + 9y$$
$$2x + 3y < 7$$
$$5x + 7y > 3$$
$$X, Y, > 0$$

OR

Explain the following in brief: -

(a) D.P Algorithm

(b) Recursive Problem

Section-C

(Long Answer Type Questions)

Note : Attempt any **two** questions. Give answer of each question in about 500 words.

$$10 \times 2 = 20$$

7. Write down the steps to convert Assignment Problem into Transportation Problem.

8. Use two phase Method to solve

$$Max\ Z = 4x_1 + x_2$$
$$3x_1 + x_2 = 3$$
$$4x_1 + 3x_2 \geq 6$$
$$x_1 + 2x_2 \leq 6$$
$$x_1, x_2 \geq 0$$

9. Draw the flow chart for solution of travelling salesman problem.

10. Explain :

   (a) Optimality Test of Transportation Problem.

   (b) Standard form of LPP

11. Write shorts notes on.

   (a) Senstivity Analysis

   (b) Multistage Decision Problem.

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