



RAN-1072

T.Y.B.Sc. (Computer Science) - Sem-V Examination

March / April - 2019

Generic Elective (IDS) 507 - 2 Operation Research

Time: 2 Hours]

[Total Marks: 50

સૂચના : / Instructions

નીચે દર્શાવેલ નિશાનીવાળી વિગતો ઉત્તરવહી પર અવશ્ય લખવી.
Fill up strictly the details of signs on your answer book

Name of the Examination:

T.Y.B.Sc. (Computer Science) - Sem-V

Name of the Subject :

Generic Elective (IDS) 507 - 2 Operation Research

Subject Code No.:

1 0 7 2

Seat No.:

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Student's Signature

Instructions:

- 1) All questions are compulsory
- 2) Non-programmable scientific calculator is allowed

1. Answer the following.

[14]

1. What is operation research?
2. What is basic feasible solution? List types of basic feasible solution.
3. Write a mathematical form of LPP.
4. What is unbounded solution?
5. Find IBFS using LCM:

		Destination				
		D1	D2	D3	D4	Supply
Source	S1	12	8	20	10	8
	S2	21	17	14	5	12
	S3	23	12	9	4	25
Demand		12	13	11	9	

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[1]

[P.T.O.]

6. What do you mean by unbalanced assignment problem?
7. List characteristics of operation research.

2. Solve the following.

[12]

1. The manager of an oil refinery must decide on the optimum mix of 2 possible blending process of 1 which the inputs and outputs production runs as follows :

Process	Input		Output	
	Crude A	Crude B	Gasoline X	Gasoline Y
1	6	4	6	9
2	5	6	5	5

The maximum available of crude A and B are 250 units and 200 units respectively. Market demand shows that at least 150 units of gasoline X and 130 units of gasoline Y must be produced. The profit per production run from process 1 and 2 are Rs. 4 and Rs. 5 respectively. Formulate the problem for maximizing the profit.

2. Solve the following problem using graphical method

Find the maximum value of $z = 6x_1 + x_2$ subject to constraints

$$2x_1 + x_2 \geq 3,$$

$$x_1 - x_2 \geq 0 \text{ and}$$

$$x_1, x_2 \geq 0.$$

OR

2. Solve the following LPP using simplex method.

Max $Z = 10x_1 + x_2 + 2x_3$ subject to the constraints

$$x_1 + x_2 - 2x_3 \leq 10$$

$$4x_1 + x_2 + x_3 \leq 20$$

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

3. Solve the following.

[12]

1. Solve the following LPP using simplex method.

Max $Z = x_1 - x_2 + 3x_3$ subject to the constraints

$$x_1 + x_2 + x_3 \leq 10$$

$$2x_1 - x_3 \leq 2$$

$$2x_1 - 2x_2 + 3x_3 \leq 0$$

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

2. Find the assignment of salesman to district that will result in maximize sale.

	A	B	C	D	E
1	32	38	40	28	40
2	40	24	28	21	36
3	41	27	33	30	37
4	22	38	41	36	36
5	29	33	40	35	39

OR

2. Solve the following transportation problem & check this solution is optimal or not.

		Depot				Available
		D1	D2	D3	D4	
Car	01	1	2	1	4	30
	02	3	3	2	2	50
	03	4	2	5	5	20
	Required	20	40	30	10	

4. Solve the following. [any two]

[12]

1. solve the following game graphically

		Player A			
Player B		2	2	3	-2
		4	3	2	6

2. Explain the principle of dominance and solve the following game.

	i	ii	iii	iv	B
1	-5	3	1	20	
2	5	5	4	6	
3	-4	2	0	5	

3. Solve the following assignment problem optimally:

	1	2	3	4
A	10	5	13	15
B	3	9	18	3
C	10	7	3	2
D	5	11	9	7
