



RAN-1046

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

March / April - 2019

Operation Research-I

(Mathematics-Elective Generic-5001)(3)

[Total Marks: 50

सूचना : / Instructions

(1)

नीचे दशावेष निशानीवाणी विगतो उत्तरवली पर अवश्य लपववी.
Fill up strictly the details of signs on your answer book

Name of the Examination:

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

Name of the Subject :

Operation Research-I

Subject Code No.: 1 0 4 6

Seat No.:

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Student's Signature

- (2) All questions are compulsory.
(3) Figures to the right indicate marks of the corresponding questions.

Q:1 (a) Attempt any three:

06

1. Write the canonical form of the L.P.P.
2. Define: feasible solution and bounded solution of L.P.P.
3. Define slack variables by giving proper illustration.
4. Write any two relationship between the primal L.P.P. and the dual L.P.P.
5. When the basic feasible solution becomes degenerate or non-degenerate?

(b) Write the dual of the following LPP. (Any One)

04

1. Min $Z = x_1 + 2x_2$
Subject to $2x_1 + 4x_2 \leq 160$
 $x_1 - x_2 = 30$
 $x_1 \geq 10$
And $x_1, x_2 \geq 0$
2. Max $Z = x_1 - x_2 + x_3$
Subject to $x_1 + x_2 + x_3 \leq 10$
 $2x_1 - x_3 \leq 2$
 $2x_1 - 2x_2 - 3x_3 \leq 6$
And $x_1, x_2, x_3 \geq 0$

Q:2 Attempt any two:

20

1. Use graphical method the following L.P.P.
Max $Z = 10x_1 + 15x_2$
Subject to $2x_1 + x_2 \leq 26$
 $2x_1 + 4x_2 \leq 56$
 $-x_1 + x_2 \leq 5$
And $x_1, x_2 \geq 0$
2. Solve the following LPP by using simplex method.
Maximize $Z = x_1 - 3x_2 + 2x_3$
Subject to $3x_1 - x_2 + 3x_3 \leq 7$
 $-x_1 + 2x_2 \leq 6$
 $-4x_1 + 3x_2 + 8x_3 \leq 10$
And $x_1, x_2, x_3 \geq 0$
3. Solve the following LPP by Big M-method.
Max $Z = 10x_1 + 15x_2$
s.t. $2x_1 + x_2 \leq 26$
 $2x_1 + 4x_2 \leq 56$
 $-x_1 + x_2 \leq 5$
And $x_1, x_2 \geq 0$

Q:3 Attempt any two:**20**

1. Solve the following LPP by using two phase simple method.

$$\text{Minimize } Z = \frac{15}{2}x_1 - 3x_2$$

$$\text{Subject to } 3x_1 - x_2 - x_3 \geq 3$$

$$x_1 - x_2 + x_3 \geq 2$$

$$\text{And } x_1, x_2, x_3 \geq 0$$

2. Solve the following LPP by using two phase simplex method.

$$\text{Min } Z = x_1 + x_2$$

$$\text{Subject to } 2x_1 + 4x_2 \geq 4$$

$$x_1 + 7x_2 \geq 7$$

$$\text{And } x_1, x_2 \geq 0$$

3. Solve the following LPP by using Big M-method.

$$\text{Minimize } Z = 3x_1 - x_2$$

$$\text{Subject to } 2x_1 + x_2 \geq 2$$

$$x_1 + 3x_2 \leq 3$$

$$x_2 \geq 4$$

$$\text{And } x_1, x_2 \geq 0$$
