



AB-3157

Third Year B.Sc. (Sem. V) Examination
March/April - 2015

Paper : 5001 (E.G.) Operations Research - I
(IDS - Mathematics) (New Course)

Time : 2 Hours]

[Total Marks : 50

Instruction :

(1)

नीचे दृशावेव निशानीवाणी विगतो उत्तरवही पर अवश्य लपवी. Fillup strictly the details of signs on your answer book.	Seat No. :
Name of the Examination :	<input type="text"/>
<input type="text" value="THIRD YEAR B.SC. (SEM. V)"/>	<input type="text"/>
Name of the Subject :	<input type="text"/>
<input type="text" value="5001 (E.G.) Operations Research - I (IDS - Maths) (New)"/>	<input type="text"/>
Subject Code No. : <input type="text" value="3"/> <input type="text" value="1"/> <input type="text" value="5"/> <input type="text" value="7"/>	<input type="text"/>
Section No. (1, 2,.....) : <input type="text" value="Nil"/>	<input type="text"/>
	Student's Signature

- (2) All questions are compulsory.
(3) Digits to the right indicate marks of that question.
(4) Follow usual notations.

- 1 Answer the following questions : (Attempt any two) 5
(1) When the BSF is called degenerate and non degenerate ?
(2) Write dual of the following primal LPP

$$\text{Min } Z = x_1 + 2x_2$$

S.t.

$$2x_1 + 4x_2 \leq 160$$

$$x_1 - x_2 = 30$$

$$x_1 \geq 10$$

$$\& x_1, x_2 \geq 0$$

- (3) Dual of Dial is primal L.P.P. True of false ? Justify your answer with proper illustration.

- 2 (a) Solve the following LPP using graphical method : 7

$$\text{Max } z = 15x_1 + 10x_2$$

S.t.

$$4x_1 + 6x_2 \leq 360$$

$$3x_1 + 0x_2 \leq 180$$

$$0x_1 + 5x_2 \leq 200$$

$$\& x_1, x_2 \geq 0$$

OR

- (a) Solve the following LPP using graphical method : 7

$$\text{Min } z = 4x_1 - 2x_2$$

S.t.

$$x_1 + x_2 \leq 14$$

$$3x_1 + 2x_2 \geq 36$$

$$2x_1 + x_2 \leq 24$$

$$\& x_1, x_2 \geq 0$$

- (b) Solve the following LPP using graphical method : 8

$$\text{Max } z = 2x_1 + x_2$$

S.t.

$$x_1 + 2x_2 \leq 10$$

$$x_1 + x_2 \leq 6$$

$$x_1 - x_2 \leq 2$$

$$x_1 - 2x_2 \leq 1$$

$$\& x_1, x_2 \geq 0$$

OR

- (b) Solve the following LPP using graphical method : 8

$$\text{Min } z = 20x_1 - 10x_2$$

S.t.

$$x_1 + 2x_2 \leq 40$$

$$3x_1 + x_2 \geq 30$$

$$4x_1 - 3x_2 \geq 60$$

$$\& x_1, x_2 \geq 0$$

- 3 (a) Solve the following L.P.P using Simplex method : 7

$$\text{Max } z = 5x_1 + 3x_2$$

S.t.

$$x_1 + x_2 \leq 2$$

$$5x_1 + 2x_2 \leq 10$$

$$3x_1 + 8x_2 \leq 12$$

$$\& x_1, x_2 \geq 0$$

OR

- (a) Solve the following L.P.P. using Simplex method : 7

$$\text{Max } z = 3x_1 + 5x_2 + 4x_3$$

S.t.

$$2x_1 + 3x_2 \leq 8$$

$$2x_2 + 5x_3 \leq 10$$

$$3x_1 + 2x_2 + 4x_3 \leq 15$$

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

- (b) Solve the following L.P.P. using Simplex method : 8

$$\text{Max } z = 3x_1 + 2x_2$$

S.t.

$$x_1 + x_2 \leq 4$$

$$x_1 - x_2 \leq 2$$

$$\& x_1, x_2 \geq 0$$

OR

- (b) Solve the following L.P.P. using Simplex method : 8

$$\text{Max } z = x_1 + x_2 + x_3$$

S.t.

$$4x_1 + 5x_2 + 3x_3 \leq 15$$

$$10x_1 + 7x_2 + x_3 \leq 12$$

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

- 4 (a) Solve the following L.P.P. using two phase Simplex method : 8

$$\text{Max } z = 3x_1 - x_2$$

St.

$$2x_1 + x_2 \geq 2$$

$$x_1 + 3x_2 \leq 2$$

$$x_2 \leq 4$$

$$\& x_1, x_2 \geq 0$$

OR

- (a) Solve the following L.P.P. using two phase Simplex method : 7

$$\text{Min } z = 5x_1 + 8x_2$$

S.t.

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

$$x_1 + 4x_2 \geq 4$$

$$x_1 + x_2 \leq 5$$

$$\& x_1, x_2 \geq 0$$

- (b) Solve the following L.P.P. using Big-M Simplex method : 8

$$\text{Min } z = 600x_1 + 500x_2$$

S.t.

$$2x_1 + x_2 \geq 80$$

$$x_1 + 2x_2 \geq 60$$

$$\& x_1, x_2 \geq 0$$

OR

- (b) Solve the following L.P.P. using Big-M Simplex method. 8

$$\text{Min } z = 5x_1 + 3x_2$$

S.t.

$$2x_1 + 4x_2 \leq 12$$

$$2x_1 + 2x_2 = 10$$

$$5x_1 + 2x_2 \geq 10$$

$$\& x_1, x_2 \geq 0$$