

DD-768

3900

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Roll No.

M. A./M. Sc. (Fourth Semester) EXAMINATION, 2020

MATHEMATICS

(Optional—A)

Paper Fourth

(Operations Research)

Time : Three Hours

Maximum Marks : 80

Note: Attempt any *two* parts from each question. All questions carry equal marks.

Unit—I

1. (a) Use Dynamic Programming to solve the following problem :

Minimize :

 $u_1^2 + u_2^2 + u_3^2$

subject to :

 $u_1 + \dot{u}_2 + u_3 = 10$

and

 $u_1, u_2, u_3 \geq 0.$

(b) Write the applications of Dynamic Programming.

P. T. O.

$$z = 3x_1 + 4x_2$$

subject to :

$$2x_1 + x_2 \le 40^{\circ}$$

 $2x_1 + 5x_2 \le 180$
 $x_1, x_2 \ge 0.$
Unit—II

2. (a) Calculate the value of game and probability of playing each strategy in the following game theory matrix :

30	40	60
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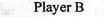
(b) Solve the following 2×4 game by graphical method :

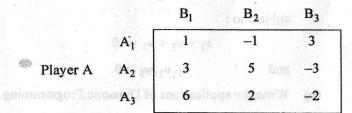
Player B

$$1 \ 2 \ 3 \ 4$$

Player A
 $1 \ 3 \ 3 \ 4 \ 0$
 $2 \ 5 \ 4 \ 4 \ 7$

(c) Solve the following 3 × 3 game by linear programming method :





Unit—III .

 3. (a) Solve the following integer programming problem using branch and bound method : Min. :

$$z = 3x_1 + 2.5x_2$$

subject to :

 $x_1 + 2x_2 \ge 20$ $3x_1 + 2x_2 \ge 50$

and $x_1, x_2 \ge 0$ and integer.

- (b) Write the limitations of integer programming.
- (c) Solve the mixed integer programming problem : minimize :

 $z = 2x_1 + 2x_2 + 4x_3$

subject to :

 $2x_1 + 3x_2 + 5x_3 \ge 2$

$$3x_1 + x_2 + 7x_3 \le 3$$

 $x_1 + 4x_2 + 6x_3 \le 5$

and

 $x_1, x_2, x_3 \ge 0.$

Unit—IV

- 4. (a) Write a short note on economic interpretation of dual linear programming.
 - (b) Explain about input-output analysis.
 - (c) Write a short note on indecomposable and decomposable economics.

P. T. O.