Printed Pages – 4

M-5347

M.A./M.Sc. (IVth Semester) Examination, 2020

MATHEMATICS

(Operation Research - II)

Time Allowed : Three Hours

Maximum Marks : 70

Note : Attempt one question from each unit. The figures in the right hand margin indicates marks.

Unit–I

Q. 1. (a) Write characteristics of Dynamic Progamming Problem. **4**

(b) By using dynamic programming technique solve the problem : **10**

Max. $z = x_1, x_2 \ldots\ldots\ldots x_n$

such that

$x_1 + x_2 + \ldots\ldots\ldots + x_n = k$

$x_i \geq 0, i = 1, 2 \ldots\ldots\ldots n$

Q. 2. (a) State Bellman's principle of optimality in dynamic programming and explain it. **4**

(b) Solve following LPP by using dynamic programming technique : **10**

Max. $z = x_1 + 9x_2$

s.t.

$2x_1 + x_2 \leq 25$

$x_2 \leq 11$

$x_1 \geq 0, x_2 \geq 0$

Unit–II

Q. 3. (a) Solve the following game : **4**

		B		
		I	II	III
A	I	6	8	6
	II	4	12	2

(b) Solve following game graphically : **10**

		B			
		I	II	III	IV
A	I	2	2	3	–1
	II	4	3	2	6

Q. 4. (a) Explain the minmax-maxmin principle for mixed strategy game. **4**

(b) Solve following game by linear programming : **10**

		B		
		I	II	III
A	I	1	–1	3
	II	3	5	–3
	III	6	2	–2

Unit–III

Q. 5. Use Branch and Bound technique solve : **14**

Maximize $z = 7x_1 + 9x_2$

s.t.

$-x_1 + 3x_2 \leq 6$

$7x_1 + x_2 \leq 35$

$0 \leq x_1, x_2 \leq 7$

x_1, x_2 are integers

Q. 6. Describe Branch and Bound Technique to solve an integer programming problem. **14**

Unit–IV

Q. 7. Write a brief note on blending problems. **14**

Q. 8. Explain Input-Output analysis in brief. **14**

Unit–V

Q. 9. (a) Write a note on convex progamming. **7**

(b) Write a note on separable programming. **7**

Q. 10. Using Kuhn-Tucker conditions solve following NLPP : **14**

Minimize $z = (x_1 - 2)^2 + (x_2 - 1)^2$

s.t.

$x_1^2 - x_2 \leq 0$

$x_1 + x_2 \leq 2$

and $x_1, x_2 \geq 0$