PE - 484

(514) M.A./M.Sc. MATHEMATICS (FOURTH SEMESTER)

Examination JUNE - 2022

Compulsory/Optional

Group

Paper-V

Name/Title of Paper- OPERATION RESEARCH-II

Time: 3:00 Hrs.] [Maximum Marks: 080

[Minimum passing marks: 029

नोटः दोनों खण्ड़ो से निर्दे□ानुसार उत्तर दीजिए। प्र□नों के अंक उनके दाहिनी ओर अंकित है।

Note: Answer From Both the Section as Directed. The Figures in the right-hand margin indicate marks.

Section - A

Q1. Answer all question. 1x10=10

a) Write the matrix notation in NLPP.

b) Define Zero sum Game.

c) Define saddle point.

d) Define waiting time.

e) Write a mixed integer programming problem.

f) Write two types of queue discipline.

g) Write a non- linear programming problem.

h) Explain two- person zero-sum games.

i) Define FCFS.

j) Define shortage cost.

Q2. Answer the following question. 2x5=10

a) Explain the recursive equation approach in D.P.

b) Define finite and infinite games.

c) write the beilman's principle of optimality in dynamic programming.

d) Write the steps of branch and bound algorithm technique.

e) What are the Factors which affecting inventory control.

Section – B

Answer the follwing questions:- 12×5=60

Q.3. Use Branch and Bound technique to solve the following problem.

Max $Z = 7x1, +9x2$

Subject to - $x_1 + 3x_2 \leq 6$

$7x_1 + x_2 \leq 35$

$o \leq x_1, x_2 \leq 7$

Whare X_1, X_2 are integers

OR

Use dynamic programming to show that

$\sum_{1=1}^{n} P_i \log P_i$

Subject to $\sum_{1=1}^{n} p_i = 1$ *is maximum when*

$P_1 = P_2 =$ ----- $= P_n = \frac{1}{n}$

Q4. Find the range of values of P and Q so that the entry (2,2,) is Q saddle point in

(a)

A \ B			
	2	9	4
	P	6	11
	7	3	4

(b)

A \ B			
	0	2	3
	8	5	9
	2	P	4

OR

Solve the game by graphical method.

(a)

A \ B				
	1	4	-2	-3
	2	1	4	5

(b)

A \ B				
	2	1	0	-2
	1	0	3	2

Q5. Solve the following NLPP

Maximize $Z = f(x) = (200x_1 - x_1^2) + (500\,x_2 - x_2^2)$

Subject to constraints.

$2x_1 + x_2 \leq 140, 2x_1 + 3x_2 \leq 108$ *and* $x_1\ x_2 \geq 0$

OR

Find the maximum value of $Z = x_1^2 + 2\,x_2^2 + 4\,x3$

S.t. $x_1 + 2_{x_2} + x_3 \leq 8, x_1, x_2, x_3 \geq 0$

Q6. Use dynamic programming to solve the L.P.P.

Maximize $Z = X_1 + 9\,X_2$

s.t.c $2x_1 + x_2 \leq 25, x_2 \leq 11,\ x_1, x_2 \geq, 0$

OR

Write short notes on Game- Theory

Q7. Neon light is an industrial park are replaced at the rate of 100 units per day the physical plant orders the Neo light periodically, it costs Rs 100 to initiate a purchase order A Neon light kept in stogare is estimated to cost about Rs. 02 per day the load time between placing and receiving and order is 12 days determine the optimal inventory policy for ordering the neon lights.

OR

Use wolfe's method to solve the QPP:

Maximize $Z = 2\,x_1 + 3\,x_2 - 2x_1^2$

s.t.c. :

$$\begin{aligned} x_1 + 4x_2 &\leq 4 \\ x_1 + x_2 &\leq 2 \\ x_1, x_2 &\geq 0 \end{aligned}$$