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MS-51

MANAGEMENT PROGRAMME (MP)

Term-End Examination

December, 2021

MS-51 : OPERATIONS RESEARCH

Time : 3 Hours   *Maximum Marks : 100*

Note : *(i)* *Attempt any **five** questions.*

   (ii) *All questions carry equal marks.*

   *(iii) The word limit for essay type questions is **800-1000** words and for short answer type questions is **200-300** words.*

1. Explain the concept of Operations Research. Account for the growing importance of operations research in business decisions.

2. Discuss integer linear programming. Give an example each of a pure and a mixed integer linear programming problem.

3. A retired person wants to invest upto an amount of ₹ 30,000 in fixed income securities. His broker recommends investing in two bonds : Bond A yielding 7% and Bond B yielding 10%. After some consideration, he decides to invest atmost ₹ 12,000 in Bond B and at least ₹ 6,000 in Bond A. He also wants the amount invested in Bond A to be at least equal to the amount invested in Bond B. What should the broker recommend if the investor wants to maximise his return on investment ? Solve graphically.

4. Solve the following transportation problem. Obtain the initial solution by NW Corner rule. Also find the optimal solution :

To

		1	2	3	4	Supply
	A	7	3	8	6	60
From	B	4	2	5	10	100
	C	2	6	5	1	40
Demand		20	50	50	80	200

5. Solve the assignment problem using HAM (Hungarian Assignment Method) :

Time Taken (in minutes) by 4 workers

Worker	Job			
	A	B	C	D
1	45	40	51	67
2	57	42	63	55
3	49	52	48	64
4	41	45	60	55

6. "When it becomes difficult to use an optimization technique for solving a problem, one has to resort to simulation technique." Discuss.

7. Write short notes on any **three** of the following :

    (a) Relationship between operations research specialist and manager

    (b) Goal programming

    (c) Inventory Control System

    (d) $2 \times n$ games

    (e) Transhipment Problem

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