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MMPO-001

MANAGEMENT PROGRAMME (MP)

Term-End Examination

June, 2023

MMPO-001 : OPERATIONS RESEARCH

Time : 3 Hours

Maximum Marks : 100

(Weightage : 70%)

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

(ii) *All questions carry equal marks. Each question carries 20 marks.*

1. What are the essential characteristics of Operations Research ? Discuss the significance and scope of operations research in modern management.
2. A firm manufactures two types of products, A and B and sells them at a profit of ₹ 2 on type A and ₹ 3 on type B. Each product is processed on two machines, G and H. Type A requires one minute of processing time on G and two minutes on H; type B requires one minute on G and one minute on H. Machine G is available

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for not more than 6 hours 40 minutes, while machine H is available for 10 hours during any working day. Formulate the problem as a linear programming problem.

3. The assignment cost of assigning any one operator to any one machine is given below :

		Operators			
		I	II	II	IV
Machine	A	10	5	13	15
	B	3	9	18	3
	C	10	7	3	2
	D	5	11	9	7

Find the optimal assignment.

4. What is integer programming ? Discuss the importance of integer programming models in supporting decisions.
5. What do you mean by the Monte-Carlo simulation method ? Discuss the steps involved in the Monte-Carlo simulation procedure.
6. At a certain petrol pump, customers arrive according to a Poisson process with an average time of 5 minutes between arrivals. The service time is exponentially distributed with mean

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time = 2 minutes. On the basis of this information, find out :

- (a) What would be the average queue length ?
 - (b) What would be the average number of customers in the queuing system ?
7. Write short notes on any *four* of the following :
- (i) Applications of Operations Research
 - (ii) Steps in Stepping–Stone Method
 - (iii) Big M Method
 - (iv) Applications of Dynamic Programming
 - (v) Goal Programming