No. of Printed Pages : 4

MMPO–001

MANAGEMENT PROGRAMME

(MP)

Term-End Examination

June, 2025

MMPO-001 : OPERATIONS RESEARCH

Time : 3 Hours *Maximum Marks : 100*

Weightage : 70%

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

(ii) All questions carry equal marks.

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1. What are the various approaches, techniques and tools of operations research ? Write a brief explanation of these techniques.
2. "Game theory provides a systematic quantitative approach for analyzing

competitive situations in which the competitors make use of logical process and techniques in order to determine an optional strategy for winning." Do you agree with this statement ? Justify your answer with suitable examples.

3. Repair of a certain type of machine requires three steps to be completed sequentially. The time taken to perform each step follows an exponential distribution with a mean of 6.67 minutes and is independent of each other. The machine breakdown follows a Poisson process with a rate of 1 per 2 hours. Assuming that there is only one repairman, find out :

   (i) the expected idle time of a machine.

(ii) the average waiting time of a broken-down machine in a queue.

(iii) the expected number of broken-down machines in the queue.

(iv) the average number of machines which are not in operation.

4. Explain the differences between PRIMAL and DUAL linear programming problems. Discuss the significance of shadow price in dual problem.

5. What is an Assignment Problem ? Explain the computational steps for solving the Hungarian method when the objective function is that of the minimization type.

6. Discuss various steps in Goal Programming Model formulation. How does GP help in decision-making ?

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

   (i) Applications of Linear Programming Problems in Business

   (ii) Sensitivity Analysis

   (iii) The M/M/ ∞ Queueing Model

   (iv) Integer Programming

   (v) Degeneracy in LP Problem

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