

Plot No. 2, Knowledge Park-III, Greater Noida (U.P.) –201306

POST GRADUATE DIPLOMA IN MANAGEMENT (2025-27)

MID TERM EXAMINATION (TERM -III)

 Subject Name: **Decision Science**

 Time: **01.00 hrs**

 Sub. Code: **PG306**

 Max Marks: **20**
Note: All questions are compulsory. Read the case and answer the questions
Kindly write the all the course outcomes as per your TLEP in the box given below:

CO1- Understand the theoretical and conceptual frameworks of decision sciences and quantitative techniques in decision-making processes.(L2)

CO2- Apply knowledge of linear programming to formulate and solve real-world decision-making problems.(L3, L5)

CO3- Evaluate and optimize solutions for transportation and assignment problems using various methods, including SOLVER tools.(L5)

CO4- Analyze game theory strategies, including pure and mixed strategies, to solve two-person zero-sum games and demonstrate dominance-based solutions.(L4)

CO5- Create models to address sequencing and queuing problems, including birth and death processes, and analyze queuing models for multiple service stations.(L4,L6)

CO6- Develop critical thinking skills to implement and manage decision-making models, techniques, and quantitative strategies in complex organizational scenarios.(L5, L6)

Read the case and answer the questions

Case Study 1: Newspaper Vendor Decision

A newspaper vendor purchases newspapers at ₹5 each and sells them for ₹10 each. Unsold newspapers cannot be returned and result in a loss. The demand varies daily between 80, 100 and 120 newspapers. The vendor must decide in advance how many newspapers to purchase without knowing the exact demand.

Possible Actions:

- Order 80 newspapers
- Order 100 newspapers
- Order 120 newspapers

Demand:

- Demand = 80
- Demand = 100
- Demand = 120

Assume that the probabilities are based on past data.

Payoff Table (Profit in ₹):

Demand Order	80	100	120
80	400	400	400
100	300	500	500
120	200	400	600
Probabilities	0.3	0.5	0.2

Questions:

Q1 (A). Explain the concept of decision making under risk and its importance in business situations. CO1

Q2 (B). Describe the concepts of Expected Monetary Value (EMV) and Expected Opportunity Loss (EOL). Also, calculate EMV and EOL for each alternative and identify the optimal decision. CO2

Case Study 2: Production Planning Problem

A furniture manufacturing company produces two types of tables: Table X and Table Y. Both require processing on two machines: Machine A and Machine B.

- Table X requires 3 hours on Machine A and 1 hour on Machine B.
- Table Y requires 1 hour on Machine A and 2 hours on Machine B.
- Profit per unit of Table X is ₹50 and Table Y is ₹40.
- Machine A is available for 120 hours per week and Machine B for 100 hours per week.

The company wants to determine how many units of each product to produce to maximize profit.

Questions:

Q1 (A). Explain the role of Linear Programming in decision making. Based on the given information, formulate the Linear Programming Problem (LPP) by clearly defining decision variables, objective function and constraints. CO1

Q2 (B). Using graphical method, determine the feasible region, identify corner points and obtain the optimal solution along with the maximum profit. CO2

Kindly fill the total marks allocated to each CO's in the table below:

COs	Blooms Taxonomy Levels	Marks Allocated
CO1	L2	10 Marks
CO2	L3, L5	10 Marks

Blooms Taxonomy Levels given below for your ready reference:

L1= Remembering

L2= Understanding

L3= Apply

L4= Analyze

L5= Evaluate

L6= Create