22ECP419N

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

MA DEGREE EXAMINATION MAY 2025
(Fourth Semester)

Branch - **ECONOMICS**

OPEARTIONS RESEARCH

Time: Three Hours Maximum: 75 Marks

SECTION-A (10 Marks)
Answer **ALL** questions
ALL questions carry **EQUAL** marks (10 × 1 = 10)

Module No.	Question No.	Question	K Level	CO
1	1	Which of the following is a key characteristic of Operations Research? a) Uses only mathematical models b) Focuses on solving real-world problems c) Only concerned with financial issues d) Limited to production systems	K1	CO1
	2	What does 'the objective function' represent in a linear programming problem? a) A constraint that restricts the decision variables b) The equation that defines the decision-making goal c) The solution set of the decision variables d) The maximum or minimum value of constraints	K2	CO1
2	3	What is a key assumption made in the transportation problem? a) Transportation costs are fixed and do not vary b) Demand is always greater than supply c) Each transportation route has a variable cost d) There is no need to balance supply and demand	K1	CO2
	4	Which of the following is a requirement for the assignment problem? a) There must be an equal number of workers and jobs b) There must be more workers than jobs c) Workers and jobs should be allocated randomly d) The cost matrix must be symmetric	K2	CO2
3	5	Which of the following is an example of a non-zero-sum game? a) Chess b) Poker c) Trade negotiations between two countries d) Snakes and Ladders	K1	CO3
	6	Which of the following can help reduce waiting times in a queuing system? a) Increasing the arrival rate b) Increasing the service rate c) Reducing the number of servers d) Increasing customer service time	K2	CO3
4	7	What is the key objective of the replacement policy in operations research? a) Maximize profits b) Minimize the total cost of operations c) Maximize the asset's lifespan d) Ensure assets are never replaced	K1	CO4
	8	Which of the following decisions helps to reduce the risk of stockouts without holding excessive inventory? a) Safety stock decision b) Reorder point decision c) Economic order quantity decision d) Lead time decision	K2	CO4

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5	9	What is the critical path in project scheduling? a) The sequence of activities with the longest duration b) The sequence of activities with the shortest duration c) The sequence of activities that can be delayed without affecting the project duration d) The path with the least number of activities	K1	CO5
	10	In a project network, the duration of a project is determined by: a) The critical path b) The longest path through the network c) The total time required for all activities d) The sum of the shortest activity durations	K2	CO5

SECTION - B (35 Marks)

Answer **ALL** questions

ALL questions carry **EQUAL** Marks (5 × 7 = 35)

Module No.	Question No.	Question	K Level	CO
1	11.a.	Explain the scope of operational research.	K2	CO1
		(OR)		
	11.b.	State the characteristics of operations research.		
2	12.a.	Explain the assignment problem and its applications.	K3	CO2
		(OR)		
	12.b.	Point out the scope of transportation problems.		
3	13.a.	Explain the concept of a game in game theory.	K3	CO3
		(OR)		
	13.b.	What are the basic components of a queuing model?		
4	14.a.	Explain the reasons for carrying inventory.	K4	CO4
		(OR)		
	14.b.	Explain the concept of optimal replacement time in replacement theory.		
5	15.a.	Write the term "critical path" in network analysis.	K4	CO5
		(OR)		
	15.b.	What are the advantages of network analysis?		

SECTION -C (30 Marks)

Answer **ANY THREE** questions

ALL questions carry **EQUAL** Marks (3 × 10 = 30)

Module No.	Question No.	Question	K Level	CO
1	16	Explain the steps involved in solving a linear programming problem using the simplex method.	K4	CO1
2	17	Discuss the different types of decision-making environments in decision theory: certainty, risk, and uncertainty. Provide examples for each.	K4	CO2
3	18	Explain the concept of mixed strategy in game theory and provide an example of its use.	K5	CO3
4	19	Describe the types of inventory decisions.	K5	CO4
5	20	Discuss the process of constructing a project network diagram.	K4	CO5

Z-Z-Z END