

K. J. Somaiya Institute of Technology, Sion, Mumbai-22
(Autonomous College Affiliated to University of Mumbai)

May-June 2026		
Program: B. Tech Scheme : III		
Regular Examination: TY Semester: VI		
Course Code: HAIMLC601 and Course Name: Game Theory using AI & ML		
Date of Exam: 30/05/2026	Duration: 02.5 Hours	Max. Marks: 60

Instructions: (1) All questions are compulsory. (2) Draw neat diagrams wherever applicable. (3) Assume suitable data, if necessary.				
Q. No.	Question	Max. Marks	CO	BT level
Q 1	Solve any two questions out of three: (05 marks each)	10		
a)	Explain the concept of Nash Equilibrium with suitable examples. Compare Cooperative and Competitive games with real-life applications.		CO1	U
b)	Consider the Prisoner's Dilemma game. Explain why rational players fail to achieve the optimal outcome. Also discuss Strict and Non-Strict Nash Equilibrium.		CO2	An
c)	Describe Cournot's and Bertrand's models of oligopoly. Compare both models based on competition strategy and market outcome.		CO1	U
Q 2	Solve any two questions out of three: (05 marks each)	10		
a)	Explain Bayesian Games with suitable examples. How does incomplete information affect the decision-making process in games?		CO2	U
b)	Discuss Repeated Prisoner's Dilemma and Evolutionary Equilibrium. How can cooperation emerge in infinitely repeated games?		CO2	An
c)	Define Artificial Intelligence and explain the evolution and applications of AI. Differentiate between Artificial Intelligence and Machine Learning.		CO3	R
Q.3	Solve any two questions out of three. (10 marks each)	20		
a)	Apply the A* Algorithm to find the shortest path between start node A to final node J in the given graph using heuristic values. Show all intermediate steps and explain the properties of A* Algorithm. Also compare A* with Best First Search.		CO3	Ap

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b)	What are local search algorithms? Explain Hill Climbing and Generate-and-Test techniques with suitable examples. Mention their advantages and limitations. Also, prove why Hill Climbing may fail to reach the global optimum in problems containing local maxima, plateaus, or ridges.		CO3	An
c)	Explain propositional logic and first-order logic with examples. Construct a Knowledge Base using the example statements and derive the conclusion using theorem proving.		CO4	Ap
Q.4	Solve any two questions out of three. (10 marks each)	20		
a)	Describe Bayesian Networks and Hidden Markov Models. Explain how probabilistic reasoning helps in handling uncertainty in AI.		CO4	U
b)	Explain the concept of Supervised Learning. Discuss Linear Regression and Logistic Regression with suitable applications.		CO5	U
c)	What is Unsupervised Learning? Explain K-Means Clustering and Hierarchical Clustering with suitable examples. Compare supervised and unsupervised learning approaches.		CO6	An
