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

July / Aug 2024

(B.Tech) Program: ~~~~~ Scheme IIB

Supplementary Regular Examination: TY   Semester: VI

Course Code: **HAIMLC601** and Course Name: **Game Theory using AI & ML**

Date of Exam: 07/02/2024   Duration: 2.5 Hours   Max. Marks: 60

Instructions:
(1) All questions are compulsory.
(2) Draw neat diagrams wherever applicable.
(3) Assume suitable data, if necessary.

		Max. Marks	CO	BT level
Q 1	**Solve any six questions out of eight:**	**12**		
i)	Discuss the Nash equilibrium condition of a Bayesian game.	2	CO1	U
ii)	Enlist rules of dominance in game theory.	2	CO2	U
iii)	Enlist properties of A* algorithm.	2	CO3	U
iv)	Explain decision making under uncertainty	2	CO4	U
v)	Enlist the functions of Support vector machine and kernel.	2	CO5	U
vi)	Explain applications of Unsupervised Learning.	2	CO6	U
vii)	What are the Dimensions of a Supervised Machine Learning Algorithm.	2	CO5	U
viii)	What are the drawbacks of Hill climbing policy?	2	CO3	U
Q 2	**Solve any four questions out of six.**	**16**		
i)	Explain Cournot's model of oligopoly.	4	CO1	U
ii)	State and explain prisoner's dilemma strategic game and discuss the Nashequilibrium strategy profile.	4	CO2	Ap

For Q2 ii), the payoff matrix:

		Suspect 2	
		Quiet	Fink
Suspect 1	Quiet	2,2	0,3
	Fink	3,0	1,1

	May-June 2024		
	(B.Tech) Program: Computer Engineering Scheme IIB		
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Date of Exam: **29/05/2024**	Duration: 2.5 Hours	Max. Marks: 60	

iii)	Give the structure of an agent in an environment.	4	CO3	U
iv)	Discuss types of learning can be accomplished by Hidden Markov Model?	4	CO4	U
v)	Explain the use of Computing the SVM for Classification.	4	CO5	U
vi)	Differentiate K-mean and Hierarchical Clustering	4	CO6	An
Q.3	**Solve any two questions out of three.**	16		
i)	Explain Mixed Strategy Equilibrium with an example.	8	CO1	U

ii)	Write first order logic statements for the following
	  i. If a perfect square is divisible by a prime p then it is also divisible by square of p.
	  ii. Every perfect square is divisible by some prime
	  iii. Alice does not like Chemistry and History
	  iv. If it is Saturday and warm, then Sam is in the park.
		8	CO4	Ap

iii)	Explain the steps in developing the machine learning application considering any suitable example.	8	CO5	U
Q.4	**Solve any two questions out of three.**	16		
i)	Explain Bayesian game with suitable example. Discuss the Nash equilibrium condition of a Bayesian game.	8	CO2	U
ii)	Find the most cost-effective path to reach the final state from initial state using A* Algorithm for following fig.1 Given an initial state of a 8-puzzle problem and final state to be reached-In our example N=8.	8	CO3	Ap

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	Initial State
	`1 2 3`
	`  4 6`
	`7 5 8` **Goal State**
	`1 2 3`
	`4 5 6`
	`7 8 `			

iii)	Trace the results of using Apriori algorithm on the grocery store example with support threshold s=33.34% and confidence threshold c=60%. Show the candidate and frequent item sets for each database scan. Enumerate all the final item sets. Also indicate the association rules that are generated and highlight the strong ones, sort them by confidence.	8	CO6	Ap

Transaction ID	Items
T1	HotDogs, Buns, Ketchup
T2	HotDogs, Buns
T3	HotDogs, Coke, Chips
T4	Chips, Coke
T5	Chips, Ketchup
T6	HotDogs, Coke, Chips

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