Duration: 3hrs **[Max Marks: 80]**

N.B.: 1) Question No 1 is Compulsory.
(2) Attempt any three questions out of the remaining five.
(3) All questions carry equal marks.
(4) Assume suitable data, if required and state it clearly.

1 *Attempt any FOUR* ***[20]***

a Define pure and mixed strategy with suitable example. ***[05]***

b Find all the Pure strategy Nash Equilibrium in the following simultaneous game, the Payoff matrix s as follow, ***[05]***

		Player 2		
		L	C	R
Player 1	T	2,0	1,1	4,2
	M	3,4	1,2	2,3
	B	1,3	0,2	3,0

c Analyze the drawbacks of the Hill Climbing Heuristic Search policy. ***[05]***

d What is planning in AI? Explain partial order planning in detail. ***[05]***

e Differentiate Artificial Intelligence vs Machine learning ***[05]***

f Explain the functions of Support Vector Machine and Kernel. ***[05]***

2 *a* State and explain Bertrand's model of oligopoly. ***[10]***

b What is Nash equilibrium condition in game theory? Discuss the Nash equilibrium condition for following strategic games. ***[10]***

i. Matching Pennies
ii. Stag Hunt

3 *a* What are the heuristic techniques in AI? Explain the use of heuristics in the following techniques in detail with suitable example. ***[10]***

i. Best first search
ii. A* algorithm

b Explain local search techniques in AI? Discuss the simulated annealing in hill climbing algorithm. ***[10]***

9B8D24806DCE4BD46D7DD6806B42B2B2

4 *a* Explain the use of Computing the SVM for Classification. ***[10]***

b Discuss types of learning can be accomplished by Hidden Markov Model? Discuss state transition diagram of HMM. ***[10]***

5 *a* Find the most cost-effective path to reach the final state from initial state using A* Algorithm. Given an initial state of a 8-puzzle problem and final state to be reached- ***[10]***

2	8	3
1	6	4
7		5

Initial State

1	2	3
8		4
7	6	5

Goal State

b What is Uncertainty? Explain Bayesian network with example. ***[10]***

6 *a* Use the k-means algorithm and Euclidean distance to cluster the following 8 data points into 3 clusters: C1=A1=(2,10), C2=A4=(5,8), C3=A7=(1,2) ***[10]***

Data points: A1=(2,10), A2=(2,5), A3=(8,4), A4=(5,8), A5=(7,5), A6=(6,4), A7=(1,2), A8=(4,9).

Form the distance matrix with Euclidean distance and solve the problem up to two iterations.

b What is association rule learning? How to evaluate the association rules? Illustrate the working with suitable example. ***[10]***

9B8D24806DCE4BD46D7DD6806B42B2B2