

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		
Player 1		L	C	R
	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]**

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

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

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

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 [10]
data points into 3 clusters: C1=A1=(2,10), C2=A4=(5,8), C3=A7=(1,2)

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? [10]
Illustrate the working with suitable example.