Total Marks: 80

**(3 Hours)**

N.B. :1) Question No.1 is **compulsory**.
    2) Attempt any **THREE** from the remaining questions.
    3) Figures to the right indicate full marks.

Q1.	(a)	Write a note on Baysian Belief networks	[5]
	(b)	Discuss PEAS representation for an Agent	[5]
	(c)	Write a note on supervised and unsupervised learning	[5]
	(d)	Write a note on Activation function	[5]
Q2.	(a)	Explain A* algorithm with example	[10]
	(b)	What is Multidimensional Scaling (MDS), and what is its primary purpose? How does MDS differ from Principal Component Analysis?	[10]
Q3.	(a)	What is a Support Vector Machine (SVM)? How does SVM handle linearly separable data	[10]
	(b)	What are forward chaining and backward chaining in the context of inference in First-Order Logic?	[10]
Q4.	(a)		[10]
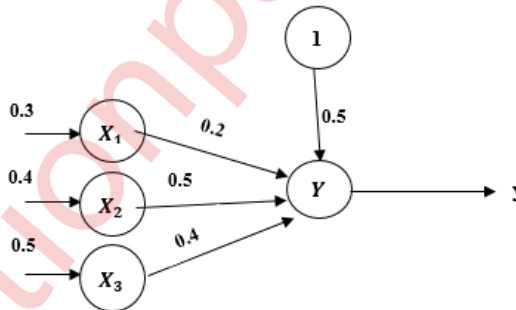
Find the output of the neuron Y for the network shown in figure using following activation functions. $(\theta = 0, \lambda = 1)$
      i) binary step function
      ii) bipolar sigmoidal

	(b)	Write a note on Expectation-Maximization Algorithm	[10]
Q5.	(a)	Discuss Naive Bayes classifier id detail. Give an example	[10]
	(b)	What are ensemble methods in machine learning? What is the AdaBoost algorithm, and how does it work?	[10]
Q6.	(a)	What is uninformed search, and how does it differ from informed search? Explain in detail the DFS.	[10]
	(b)	What is logistic regression, and how does it differ from linear regression? Discuss the mathematical form of the logistic function?	[10]

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