CBCS SCHEME

USN

22MBABA403

Fourth Semester MBA Degree Examination, June/July 2025
Machine Learning

Time: 3 hrs. Max. Marks: 100

Note: 1. ***Answer any FOUR full questions from Q.No.1 to Q.No.7.***
2. ***Question No. 8 is compulsory.***
3. ***M : Marks , L: Bloom's level , C: Course outcomes.***

			M	L	C
Q.1	**a.**	Define Machine Learning. What are the challenges of Machine Learning?	**03**	**L1**	**CO1**
	b.	What is debugging in Machine Learning. List out the challenges in debugging.	**07**	**L2**	**CO1**
	c.	Briefly explain the types of Machine Learning.	**10**	**L2**	**CO2**
Q.2	**a.**	Justify the need of python programming in machine learning.	**03**	**L1**	**CO1**
	b.	What is regression method. Explain only two regression models.	**07**	**L2**	**CO2**
	c.	Define perception, with neat diagram explain multilayer perception with its activation function.	**10**	**L3**	**CO2**
Q.3	**a.**	Interpret Artificial Neural Network (ANN) with its applications.	**03**	**L1**	**CO1**
	b.	What is Support Vector Machine. (SVM). Explain gradient descent algorithm.	**07**	**L3**	**CO3**
	c.	Define Decision Tree. What are the steps in ID3 algorithm.	**10**	**L3**	**CO3**
Q.4	**a.**	What are the different types of crossover operator in Genetic Algorithm.	**03**	**L1**	**CO2**
	b.	Illustrate the different issues in decision tree learning and explain any three.	**07**	**L2**	**CO2**
	c.	Explain Genetic Algorithm with its steps. Write genetic program tree for $\text{Sin}(x)+\sqrt{x^2+y}$.	**10**	**L3**	**CO3**
Q.5	**a.**	Differentiate between Boosting and Bagging.	**03**	**L5**	**CO3**
	b.	Explain Expectation Maximization. List Applications.	**07**	**L2**	**CO3**
	c.	Explain different Ensembling Techniques.	**10**	**L2**	**CO3**
Q.6	**a.**	Explain Markov Decision Process.	**03**	**L1**	**CO3**
	b.	Explain Q Learning algorithm. List the applications of Q Learning.	**07**	**L2**	**CO3**
	c.	Explain Q learning and Q function with example.	**10**	**L4**	**CO4**

Q.7	**a.**	Differentiate between Augmented Reality and Virtual Reality.	**03**	**L5**	**CO4**
	b.	What is Augmented Reality. Explain different types of Augmented Reality (AR)	**07**	**L2**	**CO4**
	c.	Explain different visualization techniques for Augmented Reality.	**10**	**L3**	**CO4**
Q.8		**CASE STUDY** Ravi and Raju decided to play tennis on Sunday. But, they want to make sure the weather is suitable or not. They collected 14 days weather forecast report. The report contains 4 attributes such as Outlook, Temperature, Humidity and Wind. Play Tennis is the target attribute. Use decision tree algorithm to decide the weather is suitable to play tennis or not.			

Day	Outlook	Temperature	Humidity	Wind	Play Tennis
D_1	Sunny	Hot	High	Weak	No
D_2	Sunny	Hot	High	Strong	No
D_3	Overcast	Hot	High	Weak	Yes
D_4	Rain	Mild	High	Weak	Yes
D_5	Rain	Cool	Normal	Weak	Yes
D_6	Rain	Cool	Normal	Strong	No
D_7	Overcast	Cool	Normal	Strong	Yes
D_8	Sunny	Mild	High	Weak	No
D_9	Sunny	Cool	Normal	Weak	Yes
D_{10}	Rain	Mild	Normal	Weak	Yes
D_{11}	Sunny	Mild	Normal	Strong	Yes
D_{12}	Overcast	Mild	High	Strong	Yes
D_{13}	Overcast	Hot	Normal	Weak	Yes
D_{14}	Rain	Mild	High	Strong	No

	a.	Explain the process of construction of decision tree.	**05**	**L2**	**CO3**
	b.	Calculate the gain for attribute Humidity and Wind.	**10**	**L3**	**CO3**
	c.	Construct the complete decision tree for the given set of data.	**05**	**L3**	**CO3**

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