

G. Narayanamma Institute of Technology & Science**(Autonomous) (for Women)**

Shaikpet, Hyderabad- 500 104

III-B.Tech II-Semester Regular/Supplementary Examinations, May - 2024**INTRODUCTION TO MACHINE LEARNING****(Common to CSM & CSD)****Max. Marks: 70****Time: 03 Hours****Note:**

1. Question paper comprises of **Part A** and **Part B**.
2. **Part A** is compulsory which carries 10 marks. Answer all questions in Part A.
3. **Part B** (for 60 marks) consists of **five questions** with **“either” “or”** pattern. Each question carries 12 marks and may have a,b,c as sub questions. The student has to answer any one full question.

PART-A*(Answer 05 questions. Each question carries 2 marks)*

Q.No.	Question	Marks	CO	B L
Q.1	a) Define concept learning and discuss with an example.	[02]	CO1	[L2]
	b) Write the purpose of bias and variance in machine learning?	[02]	CO2	[L1]
	c) Define Bayes theorem.	[02]	CO3	[L1]
	d) Differentiate lazy and eager learning techniques.	[02]	CO4	[L3]
	e) What is Reinforcement Learning	[02]	CO5	[L1]

END OF PART A**PART-B***(Answer 05 full questions. Each question carries 12 marks)*

Q.No.	Question	Marks	CO	B L
Q.2 a)	Differentiate supervised and unsupervised learning. Explain with suitable examples.	[08]	CO1	[L2]
b)	Write the final version space for the below mentioned training example using candidate elimination algorithm.	[04]	CO1	[L3]

Size	Color	Shape	Class
Big	Red	Circle	No
Small	Red	Triangle	No
Small	Red	Circle	Yes
Big	Blue	Circle	No
Small	Blue	Circle	Yes

OR

Q.3 a)	What is machine learning? Explain examples of machine learning applications and its importance.	[08]	CO1	[L2]
b)	How is the candidate elimination algorithm different from Find-S algorithm?	[04]	CO1	[L2]

- Q.4 a)** Explain maximum likelihood estimation with an example. [06] CO2 [L2]
b) Discuss quadratic optimization for finding the optimal hyperplane. [06] CO2 [L2]
- OR**
- Q.5 a)** Explain regression with an example. [06] CO2 [L2]
b) Derive Optimal hyperplane for linearly separable patterns. [06] CO2 [L3]
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- Q.6 a)** With an example, discuss Naïve Bayes classifier. [06] CO3 [L2]
b) Discuss how Gain and Entropy are used to build the Decision tree in algorithm? Illustrate using an example. [06] CO3 [L2]
- OR**
- Q.7 a)** State Bayes theorem and how it is used for concept learning. [08] CO3 [L2]
b) Discuss inductive bias in decision tree learning. [04] CO3 [L2]
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- Q.8 a)** Describe k-nearest neighbor algorithm. Why is it called instance-based learning? [06] CO4 [L2]
b) Compare K means clustering with Hierarchical Clustering Techniques. [06] CO4 [L3]
- OR**
- Q.9 a)** Write about Distance weighted NN algorithm. [06] CO4 [L2]
b) With the help of numerical example explain K-means clustering algorithm in detail. [06] CO4 [L2]
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- Q.10 a)** Explain the Q function and Q Learning Algorithm assuming deterministic rewards and actions with example. [06] CO5 [L3]
b) What is genetic programming? How can you represent Genetic programs? [06] CO5 [L2]
- OR**
- Q.11 a)** What is the Q function? Write an algorithm for learning Q. [06] CO5 [L2]
b) Write a short notes on the following terms: [06] CO5 [L2]
(i) Selection (ii) Crossover (iii) Mutation

END OF PART B
END OF THE QUESTION PAPER