Roll No. | | | | | | | | | | |

SHAMBHUNATH INSTITUTE OF ENGINEERING AND TECHNOLOGY

Subject Code: KCS055 **Subject: MACHINE LEARNING TECHNIQUES**

Course: B.Tech **SEMESTER: Vth**

SECOND SESSIONAL EXAMINATION, ODD SEMESTER, (2024-2025)

Branch: COMPUTER SCIENCE & ENGINEERING

Time – 2hrs. **MaximumMarks–45**

NOTE :(Attempt All Sections)

1. Attempt any FIVE of the following.

QN	QUESTION	Marks	CO	BL
a.	Explain how to handling the missing or corrupted values in the dataset.	2	CO3	L2
b.	What is Naive Bayes?	2	CO2	L2
c.	What is the basic principle of a Support Vector Machine?	2	CO2	L2
d.	What are the different types of Learning/ Training models in ML?	2	CO2	L3
e.	What is sample complexity of a Learning Problem?	2	CO3	L2
f.	List the advantages and disadvantages of using Artificial Neural Networks.	2	CO3	L2

2. AttemptAny ONE of the following.

QN	QUESTION	Marks	CO	BL
a.	What are ensemble models? Explain how ensemble techniques yield better learning as compared to traditional classification ML algorithms.	5	CO3	L3
b.	Find the maximally general hypothesis and maximally specific hypothesis for the training examples given in the table using the candidate elimination algorithm. Given Training Example:	5	CO3	L4
c.	Explain the concept of deep learning and its relation to traditional machine learning methods	5	CO4	L4

Sky	Temp	Humidity	Wind	Water	Forecast	Sport
Sunny	warm	Normal	Strong	warm	same	Yes
Sunny	warm	High	Strong	warm	same	Yes
Rainy	cold	High	Strong	warm	change	No
Sunny	warm	High	Strong	cool	change	Yes

3. Attempt Any FIVE questions.

QN	QUESTION	Marks	CO	BL
a.	What is the use of Supervised Machine Learning in Modern Businesses?	2	CO4	L3

b.	Differentiate between Gradient Descent and Stochastic Gradient Descent.	2	CO2	L2
c.	What is Entropy and information theory?	2	CO3	L3
d.	Discuss linear regression and logistic regression in detail.	2	CO3	L4
e.	Illustrate the various areas in which you can apply machine learning	2	CO4	L3
f.	What problem does the EM algorithm solve?	2	CO2	L3

4. Attempt Any ONE of the following.

QN	QUESTION	Marks	CO	BL
a.	Discuss the following issues in Decision Tree Learning: 1. Overfitting the data 2. Guarding against bad attribute choices 3. Handling continuous valued attributes 4. Handling missing attribute values 5. Handling attributes with differing costs	5	CO3	L4
b.	Illustrate backpropagation algorithm by assuming the training rules for output unit weights and Hidden Unit weights.	5	CO4	L3
c.	What's the difference between Convolutional Neural Networks (CNN) and Recurrent Neural Networks (RNN) and in which cases would use each one?	5	CO4	L4

5. Attempt Any FIVE questions.

QN	QUESTION	Marks	CO	BL
a.	Compare ANN and Bayesian Network	2	CO4	L3
b.	Highlight the importance of Case Based Learning	2	CO4	L2
c.	Differentiate between Lazy and Eager Learning	2	CO4	L3
d.	Write short notes on Learning First Order Rules	2	CO5	L3
e.	Comparison of purely analytical and purely inductive learning.	2	CO5	L2
f.	Explain the role of genetic algorithm	2	CO5	L2

6. Attempt Any ONE of the following.

QN	QUESTION	Marks	CO	BL
a.	What is k-Nearest Neighbour Learning explain with example, how the KNN algorithm makes the predictions on the unseen dataset.	5	CO3	L4
b.	Differentiate between Conventional Learning and Instance-based Learning.	5	CO5	L4
c.	What are the important elements of a Reinforcement Learning Model?	5	CO5	L3