

Model Paper- 1
Hi-Tech Institute of Engineering and Technology
B.Tech (CSE /IT) Examination
(SEMESTER – 5th Sem) Odd Semester
MACHINE LEARNING TECHNIQUES – KCS055

Time: 3 Hours

Total Marks: 100

Faculty Name: Mr. Rishabh Kamal

Note: Attempt all Sections. If you require any missing data, then choose suitably.

SECTION-A

1: Attempt all parts: **(2×10=20)**

- a. What is well defined learning problem?
- b. Explain EM Algorithm.
- c. What is MAP hypothesis?
- d. What is Kernel?
- e. Explain Data Imbalance in Machine learning.
- f. Explain Entropy and information gain.
- g. What do you mean by “cost function” in ANNs?
- h. Explain the delta rule.
- i. What is Instance based learning.
- j. Explain Radial Basis Function.

SECTION-B

2: Attempt any three parts **(10x3=30)**

- a. Discuss the issues and limitations in machine learning.
- b. Explain Regression and also discuss the types of regression.
- c. Write short notes on
 - a) Bayesian Belief Networks.
 - b) Locally weighted regression
- d. What are Convolutional Neural Networks and also discuss its architecture?
- e. Discuss some of the applications of reinforcement learning and Genetic algorithms.

SECTION-C

3 : Attempt any one part of the following: **(10 x 1= 10)**

- a. Explain in details different machine learning approaches.
- b. Differentiate between supervised and unsupervised learning with suitable examples. (

4: Attempt any one part of the following: **(10 x 1= 10)**

- a. Using Naïve Bayes Classifier classify the tuple **X= (age =youth, income =medium, student =yes, credit rating =fair)** for given dataset.

RID	age	income	student	credit_rating	Class: buys_computer
1	youth	high	no	fair	no
2	youth	high	no	excellent	no
3	middle_aged	high	no	fair	yes
4	senior	medium	no	fair	yes
5	senior	low	yes	fair	yes
6	senior	low	yes	excellent	no
7	middle_aged	low	yes	excellent	yes
8	youth	medium	no	fair	no
9	youth	low	yes	fair	yes
10	senior	medium	yes	fair	yes
11	youth	medium	yes	excellent	yes
12	middle_aged	medium	no	excellent	yes
13	middle_aged	high	yes	fair	yes
14	senior	medium	no	excellent	no

b. What is SVM and also explain the concept of margins in SVMs.

5: Attempt any one part of the following: (10 x 1= 10)

a. Discuss the K nearest neighbor algorithm and also classify the datapoint (60,165) for given dataset.

Weight(x2)	Height(y2)	Class
51	167	Underweight
62	182	Normal
69	176	Normal
64	173	Normal
65	172	Normal
56	174	Underweight
58	169	Normal
57	173	Normal
55	170	Normal

b. What is a decision tree and discuss the use of decision tree for classification purpose.

6: Attempt any one part of the following: (10 x 1= 10)

a. Draw the perceptron network with the notation and explain the training algorithm of perceptron.

b. What is Backpropagation algorithm? And also derive an equation for error calculation using Backpropagation.

7: Attempt any one part of the following: (10 x 1= 10)

a. Discuss the learning tasks and Q Learning in the context of reinforcement learning.

b. What are Genetic Algorithms? Explain different operators in Genetic Algorithm.