QPC: RN20BTECH673 AR 20 Reg. No | | | | | | | | | | |

GIET UNIVERSITY, GUNUPUR – 765022

B. Tech (Seventh Semester – Regular) Examinations, November – 2023

BPEEC7027 - Machine Learning

(ECE)

Time: 3 hrs Maximum: 70 Marks

Answer ALL Questions

The figures in the right hand margin indicate marks.

PART – A: (Multiple Choice Questions) **(1 x 10 = 10 Marks)**

Q.1. Answer *ALL* questions		[CO#]	[PO#]
a.	Supervised learning and unsupervised clustering both require at least one (i) hidden attribute (ii) output attribute (iii) input attribute (iv) categorical attribute	CO2	PO3
b.	Classification problems are distinguished from estimation problems in that (i) classification problems require the output attribute to be numeric (ii) classification problems require the output attribute to be categorical (iii) classification problems do not allow an output attribute (iv) classification problems are designed to predict future outcome	CO2	PO1
c.	Which statement is true about neural network and linear regression models? (i) Both models require input attributes to be numeric (ii) Both models require numeric attributes to range between 0 and 1 (iii) The output of both models is a categorical attribute value (iv) Both techniques build models whose output is determined by a linear sum of weighted input attribute values	CO2	PO3
d.	Simple regression assumes a _____ relationship between the input attribute and output attribute. (i) Linear (ii) Quadratic (iii) reciprocal (iv) inverse	CO2	PO1
e.	The most widely used metrics and tools to assess a classification model are (i) Confusion matrix (ii) Cost-sensitive accuracy (iii) Area under the ROC curve (iv) All of the above	CO3	PO1
f.	What is/are true about kernel in SVM? 1. Kernel function map low dimensional data to high dimensional space 2. It's a similarity function (i) 1 (ii) 2 (iii) 1 and 2 (iv) None of these	CO3	PO3
g.	Which of the following is/are Common uses of RNNs? (i) Businesses Help securities traders to generate analytic reports (ii) Detect fraudulent credit-card transaction (iii) Provide a caption for images (iv) All of the above	CO4	PO3
h.	An artificial neuron receives n inputs x1, x2, x3.....xn with weights w1, w2, ...wn attached to the input links. The weighted sum_____ is computed to be passed on to a non- linear filter Φ called activation function to release the output. (i) Σw_i (ii) Σx_i (iii) $\Sigma w_i + \Sigma x_i$ (iv) $\Sigma w_i * x_i$	CO4	PO4

i. What is Reinforcement learning? CO1 PO1

(i) All data is unlabelled and the algorithms learn to inherent structure from the input data

(ii) All data is labelled and the algorithms learn to predict the output from the input data

(iii) It is a framework for learning where an agent interacts with an environment and receives a reward for each interaction

(iv) Some data is labelled but most of it is unlabelled and a mixture of supervised and unsupervised techniques can be used

j. Machine Intelligence means _____. CO2 PO1

(i) Putting your intelligence into Computer

(ii) Programming with your own intelligence

(iii) Making a Machine intelligent

(iv) Putting more memory into Computer

PART – B: (Short Answer Questions) (2 x 10 = 20 Marks)

Q.2. Answer ***ALL*** questions	[CO#]	[PO#]
a. What is K-fold Cross Validation?	CO1	PO2
b. Let the random variable X takes values -2, -1, 1, 3 with probabilities 1/4, 1/8, 1/4, 3/8 respectively. What is the expected of the random variable $Y = X^2$?	CO2	PO3
c. What are the differences between Decision Tree and KNN classifier.	CO2	PO2
d. Mention few applications of linear algebra in aspect of machine learning.	CO2	PO3
e. How is a decision tree pruned?	CO3	PO3
f. Define entropy and information gain.	CO3	PO3
g. What do You Understand by Back propagation?	CO4	PO2
h. RNN are well suited for text summarization. Justify.	CO4	PO3
i. What is the significance of Confusion Matrix?	CO1	PO2
j. Differentiate between insufficient data and non-representative data.	CO2	PO2

PART – C: (Long Answer Questions) (10 x 4 = 40 Marks)

Answer ***ALL*** questions	Marks	[CO#]	[PO#]
3. a. Explain briefly the need of machine learning.	5	CO2	PO1
b. Discuss briefly the different types of machine learning with suitable examples.	5	CO1	PO2
(OR)			
c. List out the different challenges associated with machine learning.	5	CO2	PO1
d. Describe briefly the different steps of machine learning.	5	CO1	PO2

4. a. 5 CO2 PO2

Instance	Classification	a_1	a_2
1	+	T	T
2	+	T	T
3	-	T	F
4	+	F	F
5	-	F	T
6	-	F	T

What is the entropy of this collection of training examples with respect to the target function classification? What is the information gain of a_1 and a_2 relative to these training examples? Draw the decision tree of the given dataset.

b. Write a brief note on different types of features encountered in machine learning. 5 CO2 PO1

(OR)

c. Describe collaborative filtering and how it's used in recommendation systems. 5 CO2 PO1

d.	For the given data, if a new test instance appears i.e., (6,5), obtain its class using Nearest Centroid Classifier.							5	CO3	PO1

X	3	5	4	7	6	8
Y	1	2	3	6	7	5
Class	A	A	A	B	B	B

5. a.	Explain the difference between KNN and K-means Clustering.	5	CO3	PO1
b.	Briefly describe the different parts of a Decision tree.	5	CO3	PO2
	(OR)			
c.	Explain the KNN algorithm with an example.	5	CO3	PO1
d.	What is SVM in machine learning? What are the classification methods that SVM can handle?	5	CO3	PO2
6. a.	Explain the LeNet architecture.	5	CO4	PO2
b.	What Are the Different Layers on CNN?	5	CO4	PO1
	(OR)			
c.	Differentiate between c-means clustering and k-means clustering.	5	CO4	PO2
d.	Explain VGG16 architecture.	5	CO4	PO1

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