Total No. of Questions: 6 *Total No. of Printed Pages:3*

Enrollment No.....

Faculty of Engineering
End Sem Examination Dec-2023
IT3EA07 Machine Learning

Programme: B.Tech. Branch/Specialisation: IT

Duration: 3 Hrs. **Maximum Marks: 60**

Note: All questions are compulsory. Internal choices, if any, are indicated. Answers of Q.1 (MCQs) should be written in full instead of only a, b, c or d. Assume suitable data if necessary. Notations and symbols have their usual meaning.

Q.1 i. Application of machine learning methods to large databases is called- **1**

(a) Data mining (b) Artificial intelligence
(c) Big data computing (d) Internet of things

ii. Category belongs to supervised learning: **1**

(a) Classification
(b) Association Rule Mining
(c) Clustering
(d) None of these

iii. Adding more basis functions in a linear model will- **1**

(a) Decreases model bias
(b) Decreases estimation bias
(c) Decreases variance
(d) Doesn't affect bias and variance

iv. If you have only one independent variable, how many coefficients will you require to estimate in a simple linear regression model? **1**

(a) One (b) Two
(c) Both (a) & (b) (d) None of these

v. The k-means algorithm is a- **1**

(a) Supervised learning algorithm
(b) Unsupervised learning algorithm
(c) Semi-supervised learning algorithm
(d) Weakly supervised learning algorithm

vi. For unsupervised learning we have _____ model. **1**
(a) Interactive (b) Predictive
(c) Descriptive (d) Prescriptive

vii. The fundamental unit of network is- **1**
(a) Brain (b) Nucleus (c) Neuron (d) Axon

viii. What is shape of dendrites like- **1**
(a) Oval (b) Round
(c) Tree (d) Rectangular

ix. Which of the following is a widely used and effective machine learning algorithm based on the idea of bagging? **1**
(a) KNN (b) Random Forest
(c) Regression (d) Classification

x. In Random Forest the Memory requirement for the storage process? **1**
(a) High Memory (b) Low Memory
(c) No Memory (d) None of these

Q.2 i. What is meant by logistic regression? **2**

ii. What are the applications of supervised learning? **3**

iii. Differentiate between unsupervised, supervised and semi-supervised learning. **5**

OR iv. Explain candidate elimination algorithm with the help of example. **5**

Q.3 i. Differentiate between under fitting and over fitting. **2**

ii. Explain Naïve Bayes algorithm with example. **8**

OR iii. What is meant by regularization? Explain its types in detail. **8**

Q.4 i. What do you understand by Clustering? Write the name of different types of clustering. **3**

ii. With the help of K-means clustering algorithm group the following data points in to two clusters. **7**

Height	Weight
185	72
170	56
168	60
179	68

OR iii. What is dimensionality reduction? Explain Principal Component Analysis in detail. **7**

Q.5 i. What do you meant by perceptron? Explain with example. **4**

ii. Explain the architecture of an artificial neural network. **6**

OR iii. Explain Tensorflow and Keras python machine learning libraries in detail. **6**

Q.6 Attempt any two:

i. Explain Reinforcement Learning with the help of example. **5**

ii. Explain ensemble technique bagging and boosting in detail. **5**

iii. Is Random Forests method is better than Decision tree method? Justify your answer. **5**

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Marking Scheme

Machine Learning (T) - IT3EA07 (T)

Q.1	i)	a) Data mining		**1**
	ii)	a) Classification		**1**
	iii)	Adding more basis functions in a linear model will a) Decreases model bias		**1**
	iv)	If you have only one independent variable, how many coefficients will you require to estimate in a simple linear regression model? (b) Two		**1**
	v)	The k-means algorithm is a b) Unsupervised learning algorithm		**1**
	vi)	For unsupervised learning we have ____ model. c) Descriptive		**1**
	vii)	The fundamental unit of network is c) Neuron		**1**
	viii)	What is shape of dendrites like c) Tree		**1**
	ix)	Which of the following is a widely used and effective machine learning algorithm based on the idea of bagging? (b) Random Forest		**1**
	x)	In Random Forest the Memory requirement for the storage process? (a) High Memory		**1**
Q.2	i.	Explanation of logistic regression	(As per explanation)	**2**
	ii.	Three type of supervised learning.	(1 mark for each)	**3**
	iii.	Difference	(1 mark for each)	**5**
OR	iv.	Candidate elimination algorithm Example explanation	2 Marks 3 Marks	**5**
Q.3	i.	Difference	(1 Mark for each)	**2**
	ii.	Naïve Bayes algorithm Example explanation	3 Marks 5 Marks	**8**
OR	iii.	Regularization Type's explanation in detail.	3 Marks 5 Marks	**8**
Q.4	i.	Clustering Names of different types of clustering.	1 Mark 2 Marks	**3**
	ii.	K-means clustering algorithm concept Group 4 data points 1.5 mark for each	1 Mark (1.5*4=6 Marks)	**7**
OR	iii.	Dimensionality reduction Principal Component Analysis in	3 Marks 4 Marks	**7**
Q.5	i.	Perceptron Example explanation	2 Marks 2 Marks	**4**
	ii.	Artificial neural network Architecture explanation	2 Marks 4 Marks	**6**
OR	iii.	Tensorflow Keras python machine learning libraries	3 Marks 3 Marks	**6**
Q.6				
	i.	Reinforcement Learning Example explanation	2 Marks 3 Marks	**5**
	ii.	Ensemble technique bagging Boosting	2.5 Marks 2.5 Marks	**5**
	iii.	Better technique name Justification	1 Mark 4 Marks	**5**

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