

Enrollment No.....



Faculty of Engineering
End Sem Examination Dec-2023
CS3EA07 / CB3EL01 Machine Learning

Programme: B.Tech. Branch/Specialisation: CSE All / CSBS

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. What's the penalty term for the Lasso regression? 1
 (a) The square of the magnitude of the coefficients
 (b) The square root of the magnitude of the coefficients
 (c) The absolute sum of the coefficients
 (d) The sum of the coefficients
- ii. If the cost function is convex, then it converges to a _____. 1
 (a) Global maximum (b) Global minimum
 (c) Local maximum (d) Local minimum
- iii. Classification is appropriate when you _____. 1
 (a) Try to predict a continuous valued output
 (b) Try to predict a class or discrete valued output
 (c) Try to predict continuous valued or discrete valued output
 (d) None of these
- iv. With the help of a confusion matrix, we can compute _____. 1
 (a) Recall (b) Precision (c) Accuracy (d) All of these
- v. Which of the following is a disadvantage of decision trees? 1
 (a) Decision trees are prone to be overfit
 (b) Decision trees are robust to outliers
 (c) Factor analysis
 (d) None of these
- vi. Which of the following is a widely used and effective machine learning algorithm based on the idea of bagging? 1
 (a) Decision tree (b) Random forest
 (c) Regression (d) Classification

[3]

- vii. How does the state of the process is described in Hidden Markov Model (HMM)? **1**
 (a) Single random variable (b) Literal
 (c) Single discrete random variable (d) None of these
- viii. _____POS tagger uses probabilities. **1**
 (a) Rule based (b) Stochastic
 (c) Procedure based (d) Object based
- ix. The goal of clustering is to _____. **1**
 (a) Divide the data points into groups
 (b) Classify the data point into different classes
 (c) Predict the output values of input data points
 (d) All of these
- x. What is a dendrogram? **1**
 (a) A hierarchical structure
 (b) A diagram structure
 (c) A graph structure
 (d) None of these
- Q.2 i. What is regression in machine learning? Give an example. **2**
 ii. What is supervised learning? What is the role of model in supervised learning? **3**
 iii. Write a note on gradient descent with necessary example. **5**
 OR iv. Explain least squares regression with necessary example. **5**
- Q.3 i. What is classification? Give an example. **2**
 ii. Explain with necessary example Area Under Curve and F1 measure with the usefulness in supervised learning. **8**
 OR iii. Explain feature engineering in detail. **8**
- Q.4 i. What is decision tree? Brief the working of decision tree. **3**
 ii. Explain support vector machine algorithm with necessary example. **7**
 OR iii. Write a note on bagging and boosting with necessary examples. **7**
- Q.5 i. What is part-of-speech tagging? Give example. **4**
 ii. Explain Arriori algorithm with the help of an example. **6**
 OR iii. Explain Hidden Markov Model with example. **6**

[4]

- Q.6 Attempt any two: **5**
 i. Explain average linkage algorithm with example. **5**
 ii. Explain DBSCAN algorithm with example. **5**
 iii. Write a note on anomaly and outlier detection. **5**

[1]

Marking Scheme
Machine Learning-CB3EL01(T)

Q.1	i)	c) The absolute sum of the coefficients		1
	ii)	b) global minimum		1
	iii)	b) try to predict a class or discrete valued out put		1
	iv)	d) all of these		1
	v)	a) Decision trees are prone to be overfit		1
	vi)	b) Random Forest		1
	vii)	c) Single discrete random variable		1
	viii)	b) Stochastic		1
	ix)	a) divide the data points into groups		1
	x)	a) A hierarchical structure		1
Q.2	i.	Regression in Machine Learning	1 Mark	
		Example	1 Mark	2
	ii.	Supervised learning	1 Mark	
		The role of model in supervised learning	2 Marks	3
	iii.	Gradient Descent	1 Mark	
OR		Explaining Gradient Descent	2 Marks	5
		Example	2 Marks	
	iv.	Least Squares Regression	1 Mark	
		Explaining Least Square Regression	2 Marks	5
		Example	2 Marks	
Q.3	i.	Classification	1 Mark	
		Example	1 Mark	2
	ii.	Area Under Curve	1 Mark	
		Explain usefulness of AUC with example	3 Marks	8
		F1 Score	1 Mark	
OR		Explain usefulness of F1 score with example	3 Marks	~
	iii.	Feature Engineering	1 Marks	
		Explanation with example	7 Marks	8
Q.4	i.	Decision Tree	1 Mark	
		Briefing DT with figure	2 Marks	3

[2]

OR	ii.	Support Vector Machine	1 Mark	
		Figure	1 Mark	7
		Explaining algorithm with example	5 Marks	
	iii.	Bagging	1 Mark	
		Explanation of bagging with example	2.5 Marks	7
Q.5		Boosting	1 Mark	
		Explanation of boosting with example	2.5 Marks	
	i.	Part of speech tagging	2 Marks	
		Example with explanation	2 Marks	4
	ii.	Apriori Algorithm with example	(As per explanation)	6
OR				6
	iii.	Hidden Markov model with example	(As per explanation)	
				6
Q.6	i.	Average linkage	1 Mark	
		Algorithm with example and figure	4 Marks	5
	ii.	DBSCAN	1 Mark	
		Algorithm with example	4 Marks	5
	iii.	Anomaly and outlier detection and its usage	3 Marks	
		Example	2 Marks	5
