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Question Paper Code: 99320

B.E. / B.Tech. DEGREE EXAMINATION, APRIL 2024

Elective

Electrical and Electronics Engineering

19UEE920- MACHINE LEARNING

(Regulations 2019)

Duration: Three hours

Maximum: 100 Marks

PART A - (10 x 1 = 10 Marks)

1. If machine learning model output involves target variable then that model is called as CO1 -R
 - (a) descriptive model
 - (b) predictive model
 - (c) reinforcement learning
 - (d) all of the above
2. In what type of learning labeled training data is used CO1 -R
 - (a) unsupervised learning
 - (b) supervised learning
 - (c) reinforcement learning
 - (d) active learning
3. Regression trees are often used to be CO2- R
 - (a) Linear
 - (b) Non-linear
 - (c) Categorical
 - (d) Symmetrical
4. How do you choose the root node while constructing a Decision Tree? CO2- R
 - (a) attribute with high entropy
 - (b) high entropy and information gain
 - (c) largest information gain
 - (d) None of the above
5. ID3 stands for CO3- R
 - (a) Induction Decision Tree
 - (b) Iterative Data base
 - (c) Iterative Dichotomiser
 - (d) Iterative Decision Tree
6. The output of training process in machine learning is CO3- R
 - (a) machine learning model
 - (b) machine learning algorithm
 - (c) null
 - (d) accuracy

- 7 You are given reviews of few netflix series marked as positive, negative and neutral. Classifying reviews of a new netflix series is an example of CO4- App
- (a) supervised learning (b) unsupervised learning
(c) semisupervised learning (d) reinforcement learning
- 8 _____ finds the most specific hypothesis consistent with the training example CO4- R
- (a) Find-S (b) Rote-Learn (c) Candidate Elimination (d) All of the above
- 9 Back propagation is a learning technique that adjusts weights in the neural network by propagating weight changes CO5- R
- (a) Forward from source to sink
(b) Backward from sink to source
(c) Forward from source to hidden nodes
(d) Backward from sink to hidden nodes
- 10 The Bayes rule can be used in CO5- R
- (a) Solving queries (b) Increasing complexity
(c) Decreasing complexity (d) Answering probabilistic query

PART – B (5 x 2= 10Marks)

11. Explain different perspectives and issues in Machine Learning. CO1-U
12. Write a note on (i) Perceptron Training Rule (ii) Gradient Descent and Delta Rule. cuss some applications of machine learning with examples. CO2-U
13. Discuss the major drawbacks of the K-nearest Neighbor learning Algorithm and how it can be corrected. CO3 -U
14. Discuss Maximum Likelihood and Least Square Error Hypothesis. CO4 -App
15. Define (i) Prior Probability (ii) Conditional Probability (iii) Posterior Probability CO5 -U

PART – C (5 x 16= 80Marks)

16. (a) Explain CO1 -U (16)
- (i) Concept Learning (8 marks)
(ii) First order Rules (8 marks)

Or

- (b) Explain the steps in designing learning systems in detail. CO1-U (16)

17. (a) Write the final version space for the below-mentioned training example using the candidate elimination algorithm. CO2 -App (16)

Origin	Manufacturer	Color	Decade	Type	Example Type
Japan	Honda	Blue	1980	Economy	Positive
Japan	Toyota	Green	1970	Sports	Negative
Japan	Toyota	Blue	1990	Economy	Positive
USA	Chryster	Red	1980	Economy	Negative
Japan	Honda	White	1980	Economy	Positive
Japan	Toyota	Green	1980	Economy	Positive
Japan	Honda	Red	1980	Economy	Negative

Or

- (b) With the given data set, find B_0 and B_1 by using logistic Regression. CO2 -App (16)

When $X = 6$, find the value of Y .

X	1	2	4	3	5
Y	1	3	3	2	5

18. (a) Classify a set of 10 students in to two clusters based on the obtained marks and rank using appropriate method. (Analyze) CO3 -Ana (16)

Marks	99	59	97	87	86	77	67	57	47	40
Rank	1	7	2	3	4	5	6	8	9	10

Or

- (b) By using the fitness function as $f(x) = 2x$ with the interval $[0, 15]$, find the optimal solution using appropriate algorithm. CO3-Ana (16)

19. (a) Derive an equation for MAP hypothesis using Bayes theorem and explain Maximum Likelihood Hypothesis for predicting probabilities. CO4- Ana (16)

Or

- (b) Consider the sample dataset mentioned below and calculate $\frac{\partial L}{\partial W_1}$ by using back propagation algorithm. Assume 1. Your network has only one hidden layer. 2. All the weights are equal to 1 and all the bias are equal to 0. CO4-Ana (16)

Name	Weight (lb)	Height (in)	Gender
Alice	133	65	F
Bob	160	72	M
Charlie	152	70	M
Diana	120	60	F

20. (a) Explain Back Propagation algorithm with example. CO5-U (16)
- Or
- (b) Explain CO5- U (16)
- (i) Radial Basis Function (8 marks)
 - (ii) Case Based Reasoning (8 marks)