

Model Question Paper-1 with effect from 2019-20 (CBCS Scheme)

USN

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Sixth Semester B.E. Degree Examination Machine Learning

TIME: 03 Hours

Max. Marks: 100

Note: 01. Answer any **FIVE** full questions, choosing at least **ONE** question from each **MODULE**.

| Module – 1 | | | | | | | | | | |
|------------|-----|---|---------------------|--------------|----------------|-----------------|---------------------|--------------|-----------------|--------------------|
| Q.1 | (a) | What is Machine Learning? Explain the applications of Machine Learning. | | | | | | | 04M | |
| | (b) | Discuss the any four main challenges of machine learning | | | | | | | 08M | |
| | (c) | Consider the “Japanese Economy Car” concept and instance given in Table 1., Illustrate the hypothesis using Candidate Elimination Learning algorithm. Table 1. | | | | | | | 08M | |
| | | 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 | Chrysler | Red | 1980 | Economy | Negative | | | |
| | | Japan | Honda | White | 1980 | Economy | Positive | | | |
| OR | | | | | | | | | | |
| Q.2 | (a) | Explain Find-S algorithm and show its working by taking the enjoy sport concept and training instances given in Table 2. | | | | | | | 10M | |
| | | | Example | Sky | AirTemp | Humidity | Wind | Water | Forecast | Enjoy Sport |
| | | | 1 | Sunny | Warm | Normal | Strong | Warm | Same | Yes |
| | | | 2 | Sunny | Warm | High | Strong | Warm | Same | Yes |
| | | | 3 | Rainy | Cold | High | Strong | Warm | Change | No |
| | | | 4 | Sunny | Warm | High | Strong | Cool | Change | Yes |
| | | Table 2. | | | | | | | | |
| | (b) | Discuss the features of an unbiased Learner. | | | | | | | 06M | |
| | (c) | State the following problems with respect to Tasks, Performance, and Experience: i) A Checkers learning problem ii) A Robot driving learning problem. | | | | | | | 04M | |
| Module – 2 | | | | | | | | | | |
| Q.3 | (a) | In context to prepare the data for Machine Learning algorithms, Write a note on (i) Data Cleaning (ii) Handling text and categorical attributes (iii) Feature scaling | | | | | | | 10M | |
| | (b) | With the code snippets show how Grid Search and Randomized Search helps in Fine-Tuning a model. | | | | | | | 10M | |

| OR | | | |
|-------------------|------------|--|-------------|
| Q.4 | (a) | Using code snippets, outline the concepts involved in i) Measuring accuracy using Cross-Validation. ii) Confusion Matrix. iii) Precision and Recall. | 10M |
| | (b) | With the code snippet explain how Multilabels classification different from multiclass Multioutput classification? | 10M |
| Module – 3 | | | |
| Q.5 | (a) | what is gradient descent algorithm and discuss its various types. | 10M |
| | (b) | In Regularized Linear Models illustrate the three different methods to constrain the weights. | 10M |
| OR | | | |
| Q.6 | (a) | With respect to Nonlinear SVM Classification, explain Polynomial Kernel Gaussian and RBF Kernel along with code snippet. | 10M |
| | (b) | Show that how SVMs make predictions using Quadratic Programming and Kernelized SVM. | 10 M |
| Module – 4 | | | |
| Q.7 | (a) | With an example dataset examine how Decision Trees are used in making predictions. | 10M |
| | (b) | Explain The CART Training Algorithm. | 06M |
| | (c) | Identify the features of Regression and Instability w.r.t decision trees. | 04M |
| OR | | | |
| Q.8 | (a) | In context to Ensemble methods determine the concepts of i) Bagging and Pasting. ii) Voting Classifiers. | 10M |
| | (b) | Examine the following boosting methods along with code snippets. i) AdaBoost ii) Gradient Boosting | 10M |
| Module – 5 | | | |
| Q.9 | (a) | Write Bayes theorem. Identify the relationship between Bayes theorem and the problem of concept learning? | 10M |
| | (b) | Show that how Maximum Likelihood Hypothesis is helpful for predicting probabilities. | 10M |
| OR | | | |
| Q.10 | (a) | Construct Naïve Bayes Classifier with an Example. | 10M |
| | (b) | Derive the EM Algorithm in detail. | 10M |

| Table showing the Bloom's Taxonomy Level, Course Outcome and Programme Outcome | | | | | |
|--|-------------------------------------|---------------------------------|-------------------------------------|-------------------------------|-----------------------------|
| Question | | Bloom's Taxonomy Level attached | Course Outcome | Programme Outcome | |
| Q.1 | (a) | L1 | CO1 | PO1 | |
| | (b) | L1 | CO1 | PO1 | |
| | (c) | L2 | CO1 | PO1 | |
| Q.2 | (a) | L1 | CO1 | PO2 | |
| | (b) | L2 | CO1 | PO2 | |
| | (c) | L1 | CO1 | PO2 | |
| Q.3 | (a) | L2 | CO1 | PO3 | |
| | (b) | L2 | CO1 | PO3 | |
| Q.4 | (a) | L2 | CO1 | PO3 | |
| | (b) | L2 | CO1 | PO3 | |
| Q.5 | (a) | L2 | CO2 | PO3 | |
| | (b) | L2 | CO2 | PO4 | |
| Q.6 | (a) | L1 | CO2 | PO5 | |
| | (b) | L2 | CO2 | PO6 | |
| Q.7 | (a) | L4 | CO2 | PO9 | |
| | (b) | L2 | CO2 | PO12 | |
| | (c) | L3 | CO2 | PO5 | |
| Q.8 | (a) | L3 | CO2 | PO6 | |
| | (b) | L4 | CO2 | PO9 | |
| Q.9 | (a) | L3 | CO3 | PO9 | |
| | (b) | L3 | CO3 | PO4 | |
| Q.10 | (a) | L3 | CO3 | PO5 | |
| | (b) | L3 | CO3 | PO12 | |
| Lower order thinking skills | | | | | |
| Bloom's Taxonomy Levels | Remembering(knowledge): L_1 | | Understanding Comprehension): L_2 | Applying (Application): L_3 | |
| | Higher order thinking skills | | | | |
| | Analyzing (Analysis): L_4 | | Valuating (Evaluation): L_5 | | Creating (Synthesis): L_6 |

