

III B. Tech I Semester Regular Examinations, Dec/Jan -2022-23
MACHINE LEARNING

CSE(AIML), CSE(AI), CSE(DS), CSE(AIDS), AIDS, AIML

Time: 3 hours

Max. Marks: 70

Answer any **FIVE** Questions **ONE** Question from **Each unit**

All Questions Carry Equal Marks

UNIT-I

1. a) What is deep learning? How does it work? [7M]
 b) Explain about polynomial regression model. [7M]

(OR)

2. a) Define artificial intelligence. Describe methods and goals in AI. [7M]
 b) Describe sampling distribution of an estimator. [7M]

UNIT-II

3. a) How would you make a prediction using a Logistics Regression model? [7M]
 b) Explain about linear regression in detail. [7M]

(OR)

4. a) Describe generalized linear models. [7M]
 b) Illustrate top down construction of decision trees. [7M]

UNIT-III

5. a) Define ensemble learning. Write about random forests. [7M]
 b) Why Gaussian Kernel is used in SVM? What is the maximum possible value of RBF Gaussian kernel used in SVM? [7M]

(OR)

6. a) Distinguish between boosting and bagging. [7M]
 b) Compare and contrast linear and nonlinear SVM. [7M]

UNIT-IV

7. a) What are limitations of k-means? Explain. [7M]
 b) Describe the process of selecting a Kernel and Tuning Hyper parameters. [7M]

(OR)

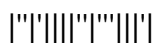
8. a) Explain about anomaly detection using Gaussian Mixtures. [7M]
 b) Describe the mechanisms present in Scikit learn for dimensionality reduction . [7M]

UNIT-V

9. Explain the following:
 a) Visualization Using Tensor Board [7M]
 b) Regression MLPs [7M]

(OR)

10. Explain the following:
 a) Logical Computations with Neurons. [7M]
 b) Building Dynamic Models Using the Sub classing API. [7M]



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UNIT-I

1. a) What is machine learning? Why it is important? [7M]
 b) Discuss in detail about in-sample risk with suitable examples. [7M]
 (OR)
2. a) What are the two main problem classes of Statistical Supervised learning? Explain them. [7M]
 b) What are tradeoffs in statistical learning? Explain. [7M]

UNIT-II

3. a) Discuss about multiclass classification. [7M]
 b) Describe k-nearest neighbors classification with an example. [7M]
 (OR)
4. a) List out the critical assumptions of liner regression. Give the formulas to find RMSE and MSE. [7M]
 b) What are distance based methods in supervised learning? Explain. [7M]

UNIT-III

5. a) Explain about bagging and pasting in detail. [7M]
 b) Describe computational complexity of nonlinear SVM classifiers. [7M]
 (OR)
6. a) Where does the gradient appear in gradient boosting? How does gradient boosting algorithm work? [7M]
 b) Explain about soft margin classification. [7M]

UNIT-IV

7. Define clustering. Explain in detail k-means algorithm along with its merits and demerits. [14 M]
 (OR)
8. Describe the curse of dimensionality. What are main approaches for dimensionality reduction? Explain them. [14 M]

UNIT-V

9. Explain the following:
 a) Classification MLPs [7M]
 b) Building a Regression MLP using the Sequential API [7M]
 (OR)
10. Explain the following:
 a) Biological Neurons Vs Artificial neuron [7M]
 b) Steps in installation of Tensor Flow [7M]



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UNIT-I

1. a) Explain about over fitting the training data in detail. [7M]
 b) Define unsupervised learning. Compare it with supervised learning. [7M]

(OR)

2. a) Distinguish between machine learning and deep learning. [7M]
 b) What cross-validation? Explain about k-fold cross-validation. [7M]

UNIT-II

3. a) Explain about the CART training algorithm. [7M]
 b) What is the basic principle of SVM? Why SVM gives better accuracy? [7M]

(OR)

4. a) Describe Naïve Bayes theorem with an example. [7M]
 b) Explain decision boundaries in logistic regression. [7M]

UNIT-III

5. a) Describe the importance of stacking with an example. [7M]
 b) Explain about SVM linear classification. [7M]

(OR)

6. a) "SVM is only directly applicable for binary classification problem". Justify. [7M]
 b) Explain about Naïve Bayes classifiers. [7M]

UNIT-IV

7. a) Describe randomized PCA and incremental PCA. [7M]
 b) Explain about DBSCAN algorithm. [7M]

(OR)

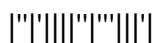
8. a) What is PCA? Explain about principal components. [7M]
 b) Describe usage of clustering for image processing. [7M]

UNIT-V

9. Describe building an Image Classifier Using the Sequential API in detail. [14M]

(OR)

10. Explain about loading and preprocessing data with Tensor Flow. [14M]



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UNIT-I

1. a) What are challenges of artificial intelligence? Explain. [7M]
 b) Give the role of training and testing data in learning [7M]
 (OR)
2. a) Distinguish between Instance-Based and Model-Based Learning [7M]
 b) Explain about empirical risk minimization. [7M]

UNIT-II

3. a) Discuss about Stochastic Gradient Descent in detail. [7M]
 b) Explain about training a binary classifier. [7M]
 (OR)
4. a) Define decision tree. Explain about Training and Visualizing a Decision Tree. [7M]
 b) Compare linear regression with polynomial regression. [7M]

UNIT-III

5. a) What is Boosting? Explain about AdaBoost in detail. [7M]
 b) How does soft margin affect classification in SVM? Explain. [7M]
 (OR)
6. a) Is voting classifier an ensemble technique? How does voting classifier work? [7M]
 b) What is SVM? Explain about SVM regression. [7M]

UNIT-IV

7. a) Discuss about usage of clustering for semi-supervised learning, [7M]
 b) Describe main approaches for dimensionality reduction. [7M]
 (OR)
8. a) What are Bayesian Gaussian Mixture Models? Explain. [7M]
 b) Briefly discuss about PCA. Compare Randomized PCA with Kernel PCA. [7M]

UNIT-V

9. Explain the following:
 a) Multi-Layer Perceptron and Back propagation [7M]
 b) Installing Tensor Flow 2 [7M]
 (OR)
10. Explain the following:
 a) The Perceptron and its applications. [7M]
 b) Building Complex Models using the Functional API. [7M]

