K24P 3652

Reg. No. : .....

Name : .....

IV Semester M.Sc. Degree (C.B.S.S. – Regular) Examination, April 2024
(2022 Admission)
STATISTICS WITH DATA ANALYTICS
Elective Course
MST 4E 04 : Machine Learning

Time : 3 Hours Max. Marks : 80

PART – A

Answer **all** questions. **Each** question carries 2 marks. **(8×2 =16)**

1. Explain reinforcement learning.
2. What is meant by maximum likelihood estimator in parametric estimation ?
3. Explain feature selection and feature extraction methods for reducing dimensionality.
4. Explain the concept of the formulation of soft margin hyperplane that uses a parameter $\nu \in [0, 1]$.
5. Prove or disprove the Boolean function 'AND' is linearly separable.
6. Discuss the advantages of online learning in training a perceptron.
7. Define cluster analysis.
8. Write the form of a mixture density with k components.

PART – B

Answer **any four** questions. **Each** question carries **4** marks. **(4×4 =16)**

9. Explain the concept of model selection and generalization in machine learning.
10. Distinguish between kernal estimator and k-nearest neighbour estimator.

P.T.O.

11. What are the uses of Bayesian approach in machine learning decision making ?

12. Explain back propagation algorithm.

13. Write short notes on hierarchical clustering.

14. Explain Expectation Maximisation Algorithm.

PART – C

Answer **any four** questions. **Each** question carries 12 marks. **(4×12 =48)**

15. a) Distinguish between supervised and unsupervised machine learning algorithms.

    b) Explain the dimensions of a supervised machine learning algorithm.

16. a) Explain probably approximately correct learning in machine learning techniques.

    b) Write a short notes on "Noise" in machine learning.

17. Discuss Principal Component Analysis technique in machine learning algorithm for finding the effective dimensionality of the data.

18. a) Explain factor analysis.

    b) In factor analysis how can we find the remaining ones if we already know some of the factors.

19. a) Explain multilayer perception.

    b) Derive the update equation for a multilayer perception with two hidden layers.

20. a) Explain k-mean clustering.

    b) Discuss the similarities and difference between average link clustering and k-mean clustering.