MCA 3rd Semester Examination, 2022

MACHINE LEARNING

PAPER – MCA-304

Full Marks : 100

Time : 3 hours

The figures in the right hand margin indicate marks

Candidates are required to give their answers in their own words as far as practicable

GROUP – A

Answer any five questions : 2 × 5

1. What is the difference between traditional program and machine learning ?

2. What is reinforcement learning ?

3. What do you mean by F1-score ?

4. Define variance.

5. What is the function of SciPy library in python ?

6. What do you mean by overfitting ?

7. Explain four applications of machine learning.

8. What is the Euclidean distance between (2, 3) and (5, 6) ?

GROUP – B

Answer any **four** questions : 15×4

9. Describe the components an Artificial Neural Network (ANN) and relates it to biological neuron. Write the formula for sigmoidal activation function ? Differentiate between supervised and unsupervised learning. $(5 + 3) + 2 + 5$

10. What is the difference between classification and regression ? What do you mean by preprocessing

in machine learning ? What do you mean by normalization ? Explain the L1 normalization procedure. 4 + 3 + 3 + 5

11. Explain in details the Decision Tree classification algorithm. What are the advantages and disadvantages of this algorithm ? What do mean by training set, test set and validation set ? 7 + 5 + 3

12. Explain the Naïve Bayes classification algorithm. What is the advantage and disadvantage of this algorithm ? What are some popular applications of this algorithm ? 8 + 5 + 2

13. How does the Support Vector Machine (SVM) binary classifier works ? What is kernel trick in SVM classifier ? Define bias. 8 + 4 + 3

14. What do you mean by cross-validation training ? Why it is necessary ? Explain the different cross-validation training techniques. 4 + 3 + 8

15. What do you mean by clustering ? Explain in details the K-means clustering technique. What *is bagging* and boosting ? 3 + 8 + 4

16. What is PCA ? What is deep learning ? Explain the architecture of Convolutional Neural Network (CNN). 3 + 3 + 9

[*Internal Assessment* – 30 Marks]