

M.E/M.TECH Degree Examination, December 2020

Second Semester

CP18105-MACHINE LEARNING TECHNIQUES

(Regulation 2018)

Time: Three hours

Maximum: 80 Marks

Answer **ALL** questions

PART A - (8 X 2 = 16 marks)

1. What is true about Machine Learning?
 - A. Machine Learning (ML) is the field of computer science
 - B. ML is a type of artificial intelligence that extract patterns out of raw data by using an algorithm or method.
 - C. The main focus of ML is to allow computer systems learn from experience without being explicitly programmed or human intervention.
 - D. All of the above

2. Which of the following is a widely used and effective machine learning algorithm based on the idea of bagging?
 - A. Decision Tree
 - B. Regression
 - C. Classification
 - D. Random Forest

3. When performing regression or classification, which of the following is the correct way to preprocess the data?
 - A. Normalize the data -> PCA -> training
 - B. PCA -> normalize PCA output -> training
 - C. Normalize the data -> PCA -> normalize PCA output -> training
 - D. None of the above

4. In which of the following cases will K-means clustering fail to give good results?
 - 1) Data points with outliers
 - 2) Data points with different densities
 - 3) Data points with nonconvex shapes

- A. 1 and 2
- B. 2 and 3
- C. 1 and 3
- D. All of the above

- 5. Formulate the decision tree for playing tennis.
- 6. Distinguish between hard threshold and soft threshold in MLP.
- 7. Artificial Neurons are analogous to biological neurons. Comment on the statement.
- 8. Formulate the evaluation problem instances that can be solved by HMM.

PART B - (4 X16 = 64 marks)

09. (a) Devise an algorithm that incrementally builds the version space given a hypothesis space H and a set E of examples as well as eliminates the inconsistent candidates. Apply your algorithm on any dataset of your choice. **(16)**

(OR)

- (b) Design a Learning system that enables a robot that learn to drive a car without any human intervention. **(16)**

10. (a) Devise a multi-layer perceptron model for student-mark vs no.of hours studied ,dataset. **(16)**

(OR)

- (b) Design radial basis neural network model for XOR function. **(16)**

11. (a) Use decision tree to classify the students in a class based on the academic performance. **(16)**

(OR)

- (b) Illustrate how to convert the arbitrary dimensions of pattern spaces into 1-D or 2-D feature space by preserving the neighbor topology. **(16)**

12. (a) Elucidate how GAs can be used in the search for large space or multimodal space. **(16)**

(OR)

- (b) Explain markov decision process with examples. **(16)**