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Subject Code:- ACSBS0513

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**NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA**

**(An Autonomous Institute Affiliated to AKTU, Lucknow)**

**B.Tech**

**SEM: V - CARRY OVER THEORY EXAMINATION - APRIL 2023**

**Subject: Machine Learning**

**Time: 3 Hours**

**Max. Marks: 100**

**General Instructions:**

**IMP:** Verify that you have received the question paper with the correct course, code, branch etc.

1. This Question paper comprises of **three Sections -A, B, & C.** It consists of Multiple Choice Questions (MCQ's) & Subjective type questions.
2. Maximum marks for each question are indicated on right -hand side of each question.
3. Illustrate your answers with neat sketches wherever necessary.
4. Assume suitable data if necessary.
5. Preferably, write the answers in sequential order.
6. No sheet should be left blank. Any written material after a blank sheet will not be evaluated/checked.

**SECTION A**

**20**

**1. Attempt all parts:-**

- 1-a. Among the following option identify the one which is not a type of learning. 1  
[CO1]
- (a) Semi Supervised learning
  - (b) Supervised Learning
  - (c) Reinforcement Learning
  - (d) Unsupervised Learning
- 1-b. ....is a widely used and effective machine learning algorithm based on the idea of bagging. [CO1] 1
- (a) Regression
  - (b) Classification
  - (c) Decision Tree
  - (d) Random Forest
- 1-c. Which of the following methods do we use to find the best fit line for data in Linear Regression? [CO2] 1
- (a) Maximum Likelihood

- (b) Logarithmic Loss  
(c) None of them true  
(d) Least Square Method
- 1-d. Choose from the following that are Decision Tree nodes? [CO2] 1
- (a) Decision Nodes  
(b) End Nodes  
(c) All of the above  
(d) LeafNodes
- 1-e. Identify the best method that is used for finding optimal clusters in k-means algorithm. [CO3] 1
- (a) Euclidean method  
(b) Manhattan method  
(c) Elbow method  
(d) Silhouette method
- 1-f. Which of the following can act as possible termination conditions in K-Means? [CO3] 1
1. For a fixed number of iterations.
  2. Assignment of observations to clusters does not change between iterations. Except for cases with a bad local minimum.
  3. Centroids do not change between successive iterations.
  4. Terminate when RSS falls below a threshold.
- (a) 1, 3 and 4  
(b) 1, 2 and 3  
(c) 1, 2 and 4  
(d) All of the above
- 1-g. Spam Classification is an example for ? [CO4] 1
- (a) Naive Bayes  
(b) Probabilistic condition  
(c) Random Forest  
(d) All the above
- 1-h. In Naive Bayes the relation between  $P(\text{Fraud})$  and  $P(\text{Truthful})$  is ? [CO4] 1
- (a) Greater than  
(b) Lesser than

- (c) Equal to
- (d) None of these
- 1-i. Which algorithm is used for solving temporal probabilistic reasoning? [CO5] 1
- (a) Hill-climbing search
- (b) Hidden markov model
- (c) Depth-first search
- (d) Breadth-first search
- 1-j. \_\_\_\_\_ is an area of Machine Learning in which about taking suitable action to maximize reward in a particular situation. [CO5] 1
- (a) Supervised learning
- (b) unsupervised learning
- (c) Reinforcement learning
- (d) None of these

**2. Attempt all parts:-**

- 2.a. Why overfitting happens? [CO1] 2
- 2.b. Define term Voronoi diagram [CO2] 2
- 2.c. What do you understand by EM algorithm ? [CO3] 2
- 2.d. How does random forest Work? [CO4] 2
- 2.e. Define term Policy. [CO5] 2

**SECTION B**

**30**

**3. Answer any five of the following:-**

- 3-a. Differentiate between Supervised learning and reinforcement Learning with example. [CO1] 6
- 3-b. Discuss the concept of PCA with its steps in detail [CO1] 6
- 3-c. Describe the Artificial neural network in detail. Discuss the advantages and Disadvantages of ANN [CO2] 6
- 3-d. Differentiate between ANN and SVM model [CO2] 6
- 3.e. What are the challenges associated with K- means and DBSCAN clustering algorithm [CO3] 6
- 3.f. Discuss mathematical concept of Naive Bayes Classifier in detail? [CO4] 6
- 3.g. Discuss the concept of Deep Q learning with its advantages [CO5] 6

**SECTION C**

**50**

**4. Answer any one of the following:-**

- 4-a. Discuss the various techniques of Machine Learning in detail [CO1] 10
- 4-b. For a movie recommendation system, which ML algorithm you choose and why? [CO1] 10

**5. Answer any one of the following:-**

- 5-a. Discuss the concept of Multilayer Networks using Backpropagation Algorithm. Discuss its advantages [CO2] 10
- 5-b. Write short note on - feed-forward neural network and Single and multilayer network [CO2] 10

**6. Answer any one of the following:-**

- 6-a. What are the challenges associated with K-means clustering? [CO3] 10
- 6-b. Compare Hierarchical Clustering and k-Means Clustering. [CO3] 10

**7. Answer any one of the following:-**

- 7-a. Explain Reinforcement Learning with real world examples. Take proper rewards in order to support the example. [CO4] 10
- 7-b. What is ensembles in machine learning? Also Explain types of ensembles methods. [CO4] 10

**8. Answer any one of the following:-**

- 8-a. What is Reinforcement Learning? How does it compare with other ML techniques? [CO5] 10
- 8-b. Differentiate between the Association Rule mining and Reinforcement Learning [CO5] 10