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NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA

(An Autonomous Institute Affiliated to AKTU, Lucknow)

B.Tech.

SEM: V - THEORY EXAMINATION (2022 - 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. Identify the type of learning in which labeled training data is used. (CO1) 1
- (a) Semi Supervised learning
  - (b) Supervised Learning
  - (c) Reinforcement Learning
  - (d) Unsupervised Learning
- 1-b. The father of machine learning is \_\_\_\_\_. (CO1) 1
- (a) Geoffrey Everest Hinton
  - (b) Geoffrey Hill
  - (c) Geoffrey Chaucer
  - (d) None of the above
- 1-c. What is a dependent variable. (CO2) 1
- (a) The value we want to predict

- (b) The parameters of the regression algorithm
- (c) The features of our dataset
- (d) The values that interfere in the value we want to predict
- 1-d. What is overfitting? (CO2) 1
- (a) Great result in training and great result in testing
- (b) Poor result in training and poor result in test
- (c) Great result in training and poor result in test
- (d) Poor result in training and poor result in testing
- 1-e. Which of the following option is true about k-NN algorithm? (CO3) 1
- (a) it can be used for classification
- (b) it can be used for regression
- (c) it can be used in both classification and regression
- (d) not useful in ml algorithm
- 1-f. What can we use in Hierarchical Clustering to find the right number of clusters ? (CO3) 1
- (a) The Elbow Method
- (b) Decision Trees
- (c) Dendrograms
- (d) Histograms
- 1-g. Method in which the previously calculated probabilities are revised with values of new probability is called \_\_\_\_\_. (CO4) 1
- (a) Revision theorem
- (b) Bayes theorem
- (c) Dependent theorem
- (d) Updation theorem
- 1-h. How the compactness of the bayesian network can be described? (CO4) 1
- (a) Locally structured
- (b) Fully structured
- (c) Partial structure
- (d) All of the mentioned
- 1-i. \_\_\_\_\_ Reinforcement is defined as when an event, occurs due to a particular behavior. (CO5) 1

- (a) Negative
- (b) Positive
- (c) neutral
- (d) None of these

1-j.	Upper confidence bound is a (CO5)	1
	(a) Reinforcement algorithm	
	(b) Supervised algorithm	
	(c) Unsupervised algorithm	
	(d) None of these	

## 2. Attempt all parts:-

2.a.	What is overfitting and underfitting? (CO1)	2
2.b.	What is classifier in machine learning? (CO2)	2
2.c.	Define types of clustering and explain one of them. (CO3)	2
2.d.	What are Bayesian Belief nets? (CO4)	2
2.e.	What is The Bellman Equation? (CO5)	2

## SECTION B

30

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

3-a.	Define Machine Learning. Discuss with examples why machine learning is important. (CO1)	6
3-b.	Explain in detail how to implement Find S Algorithm. (CO1)	6
3-c.	Explain linear and logistics Regression. (CO2)	6
3-d.	Construct an expression to compute co-variance between two variable x and y. (CO2)	6
3.e.	Explain Instance Based Learning With Examples. (CO3)	6
3.f.	How does a Gradient Boosted Decision tree work? (CO4)	6
3.g.	How would you differentiate between Positive and Negative reinforcement ? (CO5)	6

## SECTION C

50

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

4-a.	Describe direct learning and indirect learning with examples. (CO1)	10
4-b.	Define Consistent Hypothesis and Version Space. With the help of suitable	10

example explain Version Space and Representation of version Space. (CO1)

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

- 5-a. Differentiate between linear regression and multiple linear regression. CO2) 10
- 5-b. Explain Naïve Bayes Classifier with an Example. (CO4) 10

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

- 6-a. Discuss the major drawbacks of K-nearest Neighbour learning Algorithm and how it can be corrected. (CO3) 10
- 6-b. Explain the density based clustering with suitable example.. (CO3) 10

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

- 7-a. Write down Similarities and difference Between Bagging and Boosting. (CO4) 10
- 7-b. Explain the concept of Support Vector Machine. (CO4) 10

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

- 8-a. What is Q-learning? Explain it with the help of real examples. (CO5) 10
- 8-b. Explain the reinforcement learning method and also write application of reinforcement learning. (CO5) 10