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| **DIT UNIVERSITY DEHRADUN**   |  |  | | --- | --- | | **B.TECH (CSE)** | **(Regular/Back) MID TERM EXAM, ODD SEM 2023-24 (SEM V)** | | | | | | | | | | | | | |
| **Roll No.** |  |  |  |  |  |  |  |  |  |  |  |  |
| **Subject Name: Machine Learning** | | | | | | | | | | | | |

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| **Time: 2 Hours** | **Total Marks: 50** |
| **Note: All questions are compulsory. No student is allowed to leave the examination hall before the completion of the exam.**  **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**   |  |  |  | | --- | --- | --- | | **Q.1)** | **Attempt all Parts :** | | |  | **(a)** | What is Regularization? Mention the significance of regularization in machine learning. | |  | **(b)** | List out and describe any five real life applications areas of Machine Learning. | |  | **(c)** | Describe how Machine Learning can be used to develop an Artificial Intelligence System. | |  | **(d)** | Illustrate the working of Decision Tree algorithm with the help of suitable example. | |  |  | **[4 x 2.5= 10]** | | **Q.2)** | **Attempt all Parts :** | | |  | **(a)** | Explain Ensemble Learning with the help of suitable example. | |  | **(b)** | Is it necessary to train the supervised Machine learning model? If yes Describe how will you train the model (if you are having a dataset containing 100 objects). | |  | **(c)** | Discuss the significance of Over fitting and Under fitting in machine learning. Describe the way to overcome the problem raised due to Under fitting and Over fitting. | |  | **(d)** | Mention the various categories in which digital data can be classified and differentiate among them giving suitable example to each. | |  |  | **[4 x 2.5= 10]** | | **Q.3)** | **Attempt any Two Parts :** | | |  | **(a)** | Illustrate the steps of DBSCAN algorithm. Describe the significance and role of Core points, Boundary points and Noise points in DBSCAN. | |  | **(b)** | Write down the steps of Random Forest (RF) algorithm. Illustrate how RF utilizes Decision Tree for making predictions with the help of suitable example. | |  | **(c)** | Solve this question with linear regression question using one independent variable.   |  |  | | --- | --- | | X | Y | | 2 | 3 | | 4 | 7 | | 6 | 5 | | 8 | 10 | | |  |  | **[2 x 5= 10]** | | **Q.4)** | **Attempt any Two Parts :** | | |  | **(a)** | Write down the steps of Support Vector Machine (SVM) algorithm? Describe the significance of support vectors and Margin. Explain the working of Random Forest algorithm with the help of suable example. | |  | **(b)** | Write down the steps of k-mean clustering? Consider the following points A1(2,10), A2(2,5), A3(8,4), B1(5,8), B2(7,5), B3(6,4), C1(1,2), C2(4,9). Assume initial centroid as A1, B1, and C1. Calculate Euclidean distance and find out the new centroid of each cluster. | |  | **(c)** | Write short notes on the following  a) Linear Regression  b) Logistic Regression | |  |  | **[2 x 5= 10]** | | **Q.5)** | **Attempt any Two Parts :** | | |  | **(a)** | Describe the steps of Machine learning process with the help of neat and clean diagram. Mention and explain the various types of machine learning techniques giving suitable example to each. | |  | **(b)** | Write short notes of the following   1. Semi supervised learning 2. Reinforcement learning | |  | **(c)** | What is clustering? What are the various types of clustering methods? Describe each in detail giving suitable example to each. | |  |  | **[2 x 5= 10]** | | **-----END OF PAPER ----** | | | | |