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| **DIT UNIVERSITY DEHRADUN**   |  |  | | --- | --- | | **B.TECH (CSE)** | **MIDTERM EXAMINATION,ODD SEM 2022-23 (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:** | | **BTL** | **CO** | |  | **(a)** | Discuss the goals and applications of Machine Learning. | **L2** | **C01** | |  | **(b)** | The heights of animals are 555mm, 450mm, 165mm, 410mm, 350mm, 750mm and 300mm. Find out the mean and the standard deviation. | **L2** | **C01** | |  | **(c)** | What do you understand by cost function? | **L2** | **C01** | |  | **(d)** | Differentiate Bias and Variance with example. | **L2** | **C01** | |  |  | **[4 x 2.5= 10]** |  |  | |  | | |  |  | | **Q.2)** | **Attempt all Parts:** | | **BTL** | **CO** | |  | **(a)** | For designing a “SPAM FILTERING SYSTEM”- which learning will be suitable (Supervised/ Unsupervised/ Reinforcement)? Explain the suggested learning with an example and mention its advantages and disadvantages | **L2** | **C02** | |  | **(b)** | Describe data preprocessing in machine learning. Mention the ways to handle missing values in dataset. | **L2** | **C02** | |  | **(c)** | Differentiate between Supervised Learning and Unsupervised Learning. | **L2** | **C02** | |  | **(d)** | Explain the term Gradient Descent in brief. | **L2** | **C02** | |  |  | **[4 x 2.5= 10]** |  |  | |  | | |  |  | | **Q.3)** | **Attempt any Two Parts :** | | **BTL** | **CO** | |  | **(a)** | Normalize the following group of data: 200, 300,400, 600, 1000, and 1500 using min-max normalization by setting min = 0 and max = 1. | **L3** | **C01** | |  | **(b)** | Explain the concept of Linear Regression and apply it to solve the following:   |  |  | | --- | --- | | Point (X) | Point(Y) | | 1 | 3 | | 2 | 4 | | 3 | 5 | | 4 | 7 | | **L3** | **C01** | |  | **(c)** | Explain the steps required for designing a learning system. | **L2** | **C01** | |  |  | **[2 x 5= 10]** |  |  | |  | | |  |  | | **Q.4)** | **Attempt any Two Parts :** | | **BTL** | **CO** | |  | **(a)** | Apply Z score normalization to solve the following data; 1000, 1500, 2000, 3000, 5000. | **L3** | **C02** | |  | **(b)** | Differentiate between Supervised Learning and Unsupervised Learning. | **L3** | **C02** | |  | **(c)** | Explain the term Confusion Matrix and find the Accuracy, Precision, Recall and F1- Score for the given dataset;  See the source image | **L2** | **C02** | |  |  | **[2 x 5= 10]** |  |  | |  | | |  |  | | **Q.5)** | **Attempt any Two Parts:** | | **BTL** | **CO** | |  | **(a)** | Explain the following terms:( Any Three)  (a) Lasso regression  (b) Multi-Variate Regression  (c) Ridge Regression  (d) Conditional Probability  (e) Joint Probability | **L3** | **C03** | |  | **(b)** | Elaborate the concept of Bayes Theorem and apply it to solve the following:  A box of cartridges contains 30 cartridges, of which 6 are defective. If 3 of the cartridges are removed from the box in succession without replacement, what is the probability that all the 3 cartridges are defective? | **L3** | **C03** | |  | **(c)** | What is Over fitting and Under fitting, and How to overcome? | **L2** | **C03** | |  |  | **[2 x 5= 10]** |  |  | | **-----END OF PAPER ----** | | |  |  | | |