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| **DIT UNIVERSITY, DEHRADUN**   |  |  | | --- | --- | | **MCA(Regular/Back)** | **: END TERM EXAMINATION, ODD SEM 2023-24 (SEM III)** | | | | | | | | | | | | | |
| **Roll No.** |  |  |  |  |  |  |  |  |  |  |  |  |
| **Subject Name: Machine Learning** | | | | | | | | | | | | |

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| **Time: 3 Hours** | **Total Marks: 100** |
| **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 machine learning and give relevance of machine learning for the world. | |  | (b) | Define and summarize the term Clustering. | |  | (c) | Explain the concept of Bayes theorem with an example. | |  | (d) | Outline when should you use classification over regression? Explain with example. | |  |  | **[4 x 5= 20]** | | **Q.2)** | **Attempt all Parts :** | | |  | (a) | What is overfitting and underfitting? | |  | (b) | Evaluate Euclidian Distance of Point P1(3,7) from P2(1,4) and P3(7,4) | |  | (c) | Distinguish between Artificial Intelligence and Machine Learning. | |  | (d) | Dissect the two distance measure techniques used in clustering? | |  |  | **[4 x 5= 20]** | | **Q.3)** | **Attempt any two parts :** | | |  | (a) | List out how SVM algorithm finds the optimal hyperplane? | |  | (b) | Conclude why regression analysis is used? Also explain the concept of linear regression. | |  | (c) | Describe the basic working of HMM model. | |  |  | **[2 x 10= 20]** | | **Q.4)** | **Attempt any two parts :** | | |  | (a) | For the following medical data create a Decision Tree using ID3 algorithm.   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | **Sore Throat** | **Fever** | **Swollen Glands** | **Congestion** | **Headache** | **Diagnosis** | | Yes | Yes | Yes | Yes | Yes | Strep Throat | | No | No | No | Yes | Yes | Allergy | | Yes | Yes | No | Yes | No | Cold | | Yes | No | Yes | No | No | Strep Throat | | No | Yes | No | Yes | No | Cold | | No | No | No | Yes | No | Allergy | | No | No | Yes | No | No | Strep Throat | | Yes | No | No | Yes | Yes | Allergy | | No | Yes | No | Yes | Yes | Cold | | Yes | Yes | No | Yes | Yes | Cold | | |  | (b) | Illustrate supervised, unsupervised and reinforcement Learning. | |  | (c) | Classify the different layers that make up the Convolutional Neural Networks. | |  |  | **[2 x 10= 20]** | | **Q.5)** | **Attempt any two parts :** | | |  | (a) | **Apply** Naïve-Bayes algorithm on the following data set and predict the category for fruit given that fruit is {Yellow, Sweet, Long}   |  |  |  |  |  | | --- | --- | --- | --- | --- | | **Fruit** | **Yellow** | **Sweet** | **Long** | **Total** | | Mango | 350 | 450 | 0 | 650 | | Banana | 400 | 300 | 350 | 400 | | Others | 50 | 100 | 50 | 150 | | |  | (b) | Explain the principal component analysis (PCA) methodology used for feature extraction. | |  | (c) | What are the artificial networks? Explain the activation function used in artificial networks? | |  |  | **[2 x 10= 20]** | | -----END OF PAPER ---- | | | | |