**CHAROTAR UNIVERSITY OF SCIENCE & TECHNOLOGY**

**Sixth Semester of B.Tech. (IT) Examination**

**April 2020**

**IT377 MACHINE LEARNING & APPLICATIONS**

**Date: 30.04.2020, Thursday Time: 10:00 a.m. To 01:00 p.m. Maximum Marks: 70**

***Instructions:***

1. The question paper comprises of two sections.
2. Section I and II must be attempted in separate answer sheets.
3. Make suitable assumptions and draw neat figures wherever required.

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| **SECTION – I** | | | |
| **Q - 1** | | **Answer the following questions.** | **[10]** |
| **(a)** | | Differentiate between Supervised and Unsupervised learning. | [02] |
| **(b)** | | What is Machine Learning? List three applications of Machine Learning. | [02] |
| **(c)** | | What is the difference between agglomerative and divisive hierarchical clustering? | [02] |
| **(d)** | | Define terms as per Neural Networks: epoch, and iterations | [02] |
| **(e)** | | List the difference between Linear regression and Logistic regression. | [02] |
| **Q - 2** | | **Answer the following questions. [Any Two]** | **[10]** |
| **(a)** | | Write apriori property. Explain with example. | [05] |
| **(b)** | | Explain the type of learning in Machine Learning. | [05] |
| **(c)** | | Write steps to perform k-means clustering algorithm. What is the weakness of k-means clustering algorithm? | [05] |
| **Q - 3** | | **Answer the following questions. [Any Three]** | **[15]** |
| **(a)** | | Explain Q-Learning algorithm in Reinforcement Learning. | [05] |
| **(b)** | | What is instance based learning? Explain K- nearest Neighbour. | [05] |
| **(c)** | | What is the requirement to use kernel function in Support Vector Machine (SVM)? Explain with example. | [05] |
| **(d)** | | What is the use of Confusion Matrix? Explain in detail. | [05] |
| **SECTION – II** | | | |
| **Q - 4** | **Answer the following questions.** | | **[10]** |
| **(a)** | Testing set is not a part of training set. State True/False and Justify. | | [02] |
| **(b)** | What is minimum-confidence? What is an equation to calculate confidence of rule? | | **[0**2**]** |
| **(c)** | List any four machine learning open-source libraries. | | **[0**2**]** |
| **(d)** | What is the use of slack variable in SVM? | | **[02]** |
| **(e)** | List the difference between Machine Learning and Deep Learning | | **[02]** |
| **Q - 5** | **Answer the following questions. [Any Two]** | | **[10]** |
| **(a)** | Explain Back propagation algorithm in Neural Network. | | [05] |
| **(b)** | Discuss various activation functions of Artificial Neural Network. | | [05] |
| **(c)** | What is overfitting and underfitting in Machine Learning? | | [05] |
| **Q - 6** | **Answer the following questions. [Any Three]** | | **[15]** |
| **(a)** | The values of independent variable X and dependent value Y are given below:   |  |  | | --- | --- | | **X** | **Y** | | 0 | 2 | | 1 | 3 | | 2 | 5 | | 3 | 4 | | 4 | 6 |   Find the least square regression line Y= a X +b.  Estimate the value of Y when X is 10. | | [05] |
| **(b)** | Explain methods of cross-validation in classification. | | [05] |
| **(c)** | Write a short note on Convolutional Neural Networks. | | [05] |
| **(d)** | How machine learning can be helpful to predict new cases of Novel coronavirus (COVID-19)? Write a case study. | | [05] |

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