Reg. No. \_\_\_\_\_\_\_\_\_\_\_\_\_



**End Semester Examination – Nov / Dec – 2019**

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| **Code :** | **17CS2047** | **Duration :** | **3hrs** |
| **Sub. Name :** | **MACHINE LEARNING PRINCIPLES AND APPLICATIONS** | **Max. Marks :** | **100** |

**ANSWER ALL QUESTIONS (5 x 20 = 100 Marks)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Q. No.** | **Sub Div.** | **Questions** | **Course**  **Outcome** | **Marks** |
| 1. | a. | Perform KNN classification on the following dataset and predict the output for k=2.   |  |  |  |  | | --- | --- | --- | --- | | Acid Type | Acid Durability | Strength | Class | | Type 1 | 7 | 7 | Bad | | Type 2 | 7 | 4 | Bad | | Type 3 | 3 | 4 | Good | | Type 4 | 2 | 4 | Good | | Type 5 | 6 | 3 | Good | | CO2 | 15 |
| b. | Write the algorithm involved in the prediction of class label using KNN classifier. | CO1 | 5 |
| **(OR)** | | | | |
| 2. |  | List the uses of regression analysis. Explain the different types of regression techniques used for prediction. | CO3 | 20 |
|  |  |  |  |  |
| 3. |  | List out the fundamental reasons to build a machine learning model using ensemble technique. Explain in detail about the popular methods used to construct ensembles. | CO3 | 20 |
| **(OR)** | | | | |
| 4. | a. | Compare and contrast between supervised and unsupervised machine learning model. | CO2 | 5 |
| b. | Discuss how SVM classifier is used to generate an optimum hyperplane for test samples using its tuning parameters. |  | 15 |
|  |  |  |  |  |
| 5. | a. | Apply k-means clustering algorithm to the following dataset and visualize clustering output with two clusters. Write the sequence of steps involved in k-means clustering algorithm.   |  |  |  | | --- | --- | --- | | S.No | X | Y | | OB-1 | 1 | 1 | | OB-2 | 1.5 | 2 | | OB-3 | 2 | 1 | | OB-4 | 3 | 4 | | OB-5 | 5 | 7 | | OB-6 | 3.5 | 5 | | OB-7 | 4.5 | 5 | | OB-8 | 3.5 | 4.5 | | CO4 | 15 |
| b. | Compare partition based clustering with hierarchical based clustering algorithms. | CO4 | 5 |
| **(OR)** | | | | |
| 6. | a. | |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | |  | A | B | C | D | E | F | | A | 0 |  |  |  |  |  | | B | 0.17 | 0 |  |  |  |  | | C | 4.6 | 3.95 | 0 |  |  |  | | D | 2.61 | 1.92 | 2.21 | 0 |  |  | | E | 4.22 | 2.57 | 0.41 | 1 | 0 |  | | F | 3.1 | 2.53 | 1.25 | 0.5 | 0.12 | 0 |   Generate a dendogram for the given distance matrix using complete linkage clustering approaches. | CO4 | 15 |
| b. | List the advantages and disadvantages of k-medoids clustering algorithm. | CO4 | 5 |
|  |  |  |  |  |
| 7. |  | Illustrate the different types of reinforcement learning techniques used in gaming application. | CO6 | 20 |
| **(OR)** | | | | |
| 8. |  | Explain in detail about reinforcement learning approach with the help of Q-learning algorithm. | CO6 | 20 |
|  | | **Compulsory**: |  |  |
| 9. |  | Explain in detail how Artificial Neural Network is used for extracting patterns by building neural networks consisting of input and output layers. | CO1 | 20 |