<table>
<tr><td>Year :</td><td>III year</td></tr>
<tr><td>Semester:</td><td>VI SEM</td></tr>
<tr><td>Subject Name:</td><td>Machine learning</td></tr>
<tr><td>Subject Code:</td><td>6CS4-02</td></tr>
<tr><td></td><td>Unit -1</td></tr>
<tr><td>Q.1</td><td>What is Machine Learning? Differentiate between supervised, unsupervised and semi supervised learning</td></tr>
<tr><td>Q.2</td><td>Differentiate between Classification and Regression</td></tr>
<tr><td>Q.3</td><td>Explain application where machine learning can be used.</td></tr>
<tr><td>Q.4</td><td>Explain kernel method for non-linear SVM.</td></tr>
<tr><td>Q.5</td><td>Explain Linear Regression Algorithm with example</td></tr>
<tr><td>Q.6</td><td>Explain Decision Tree Algorithm. Also explain Gini index and Entropy measures used in decision tree algorithm</td></tr>
<tr><td>Q.7</td><td>Briefly Explain Support Vector machine. Also write Advantages and Disadvantages of support vector machine</td></tr>
<tr><td>Q.8</td><td>Suppose you have a database on four customers. You know their gender, income and whether or not they bought your product.<br><br><table><tr><td>S. No.</td><td>Income</td><td>Gender</td><td>Buy Product</td></tr><tr><td>1</td><td>High</td><td>Male</td><td>Yes</td></tr><tr><td>2</td><td>High</td><td>Female</td><td>No</td></tr><tr><td>3</td><td>Medium</td><td>Female</td><td>No</td></tr><tr><td>Other</td><td>Low</td><td>Male</td><td>Yes</td></tr></table>Using Naïve Bayes' algorithm predict the probability of buying product given that a customer has a high income and is male.</td></tr>
<tr><td>Q.9</td><td>Briefly Explain Logistic Regression and explain how it is used for Classification.</td></tr>
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| | **Unit -2** |
| Q.1 | What is clustering algorithm and why it is required? |
| Q.2 | Apply K-mean algorithm on given data for K=2 use C1(4) and C2(12) as initial cluster centres Data : 2,3,4,10,11,12,20,25,30,35 |
| Q.3 | Define agglomerative clustering algorithm and explain its features. |
| Q.4 | Differentiate between hierarchy clustering algorithm and probabilistic clustering. |
| Q.5 | Explain different approaches used to calculate distance in clustering Algorithms. |
| Q.6 | What is Association rule mining? Explain Apriori algorithm. |
| Q.7 | Explain FP growth tree with example |
| Q.8 | Calculate various distances between three records A, B and C, with two features**.**<br>**Feature1 Feature2**<br>**A** 45 0.05<br>**B** 60 0.05<br>**C** 52 0.09 |
| | **Unit -3** |
| Q.1 | Explain feature extraction method in details and explain goals of machine learning. |
| Q.2 | Define Feature selection method in details. |
| Q.3 | Apply singular value decomposition Technique on given data A= [1 1]<br>[0 1]<br>[-1 1]<br>And calculate diagonal matrix, orthogonal matrix. |
| Q.4 | Explain PCA techniques in details and how to calculate Eigen value and Eigen vector. |
| Q.5 | Describe Filter, Wrapper and embedded method in detail. |

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| Q.6 | When cross validation method is Selected for training a Model |
| Q.7 | A Confusion Matrix of a model applied to a set of 200 observation is given in table below. Determine Accuracy, Recall, Precision, Specificity and F1 score of model.<br><br>Predicted C1 Predicted C2<br><br>Actual C1 95 7<br><br>Actual C2 4 94 |
| Q.8 | Discuss Evaluating machine learning algorithm. |
| | **Unit-4** |
| Q.1 | What do you mean by recommendation System? |
| Q.2 | Explain value function and policy function. |
| Q.3 | What is the application of reinforcement learning? |
| Q.4 | Explain markov chain model in details |
| Q.5 | Explain markov decision process (MDP) with example. |
| Q.6 | Write Short notes on :<br>(i) Bellman Equation (ii)Policy Iteration<br>(iii) Q Learning (iv) Model based Reinforcement Learning |
| Q.7 | What are the method of State Action Reward State Action (SARSA) and how to find utility functions to be used in the learning process? |
| | **Unit-5** |
| Q.1 | Explain Multilayer network in details and how to use Content based filtering. |
| Q.2 | Describe Recommender System and compare Collaborative and Content based Filtering Methods. |
| Q.3 | Discuss the Artificial neural network with suitable example. |
| Q.4 | What is the use of deep learning in real word application? |
| Q.5 | Explain Multilayer network in details and explain its application. |
| Q.6 | Explain Back Propagation Algorithm and determine its mathematical equations |