Subject Title: Machine Learning
Subject Code: 20CST-316
Semester: V

Time: 3 Hours **Maximum Marks: 60**

Instructions: Attempt all questions

<table>
<tr><th>Q. No</th><th>Statement</th><th>CO mapping</th></tr>
<tr><td colspan="3">Section A
5 x 2 = 10 marks</td></tr>
<tr><td>1</td><td>Define Machine learning with its objectives.</td><td>CO2</td></tr>
<tr><td>2</td><td>Define goal of the support vector machine (SVM)</td><td>CO2</td></tr>
<tr><td>3</td><td>List out different algorithms can be classified under Association Rule Learning Algorithms?</td><td>CO2</td></tr>
<tr><td>4</td><td>Define any algorithm you know in to solve a problem in Reinforcement Learning</td><td>CO3</td></tr>
<tr><td>5</td><td>Define Agglomerative Clustering and divisive clustering.</td><td>CO3</td></tr>
<tr><td colspan="3">Section B
4 x 5 = 20 marks</td></tr>
<tr><td>6</td><td>Differentiate between Supervised, Unsupervised and Reinforcement Learning</td><td>CO2</td></tr>
<tr><td>7</td><td>How would you detect overfitting in Linear Models?</td><td>CO3</td></tr>
<tr><td>8</td><td>Elaborate relationship between k-Means Clustering and PCA?</td><td>CO2</td></tr>
<tr><td>9</td><td>Compare Reinforcement Learning and Supervised Learning</td><td>CO3</td></tr>
<tr><td colspan="3">Section C
3 x 10 = 30 marks</td></tr>
<tr><td>10</td><td>The values of independent variable x and dependent value y are given below:

<table><tr><td>X</td><td>Y</td></tr><tr><td>1</td><td>3</td></tr><tr><td>3</td><td>4</td></tr><tr><td>5</td><td>2</td></tr><tr><td>7</td><td>5</td></tr><tr><td>8</td><td>7</td></tr></table>Find the regression line y=ax+b. Estimate the value of y when x is 11.</td><td>CO3</td></tr>
<tr><td>11</td><td>Compare overfitting and underfitting with an intuitive explanation of the Bias-Variance Tradeoff</td><td>CO4</td></tr>
<tr><td>12</td><td>Scrutinize that Principal Component Analysis (PCA) is used for Dimensionality Reduction with an example .</td><td>CO4</td></tr>
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