## P.V.P Siddhartha Institute of Technology(Autonomous)
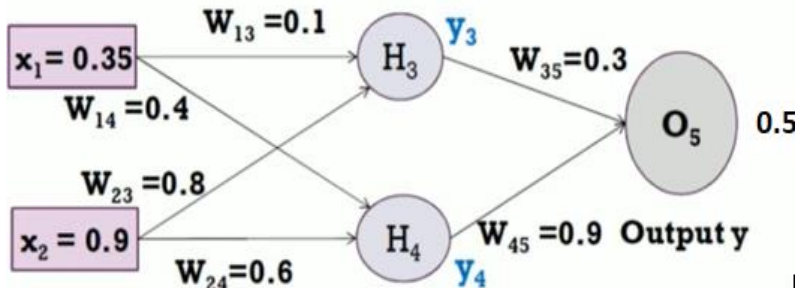
### Department of Computer Science and Engineering

| Course: B.Tech | Year: III | Semester: II | Descriptive: I | A.Y:2024-25 | |
|---|---|---|---|---|---|
| Subject Code: 20CS3602 | Subject Name: Machine Learning | | | Regulation:PVP20 | |
| Duration: 1 hr 30 min | Maximum Marks:15 Marks | | | Date: 21-01-2025 | Session: F.N |

**Answer all the Questions. Each Question carries 5 Marks**                     **3×5M=15M**

| Q. No | | | Marks | CO | Level |
|---|---|---|---|---|---|
| 1 | a) | Construct a decision tree for the following example and Classify to predict which patients are high risk for heart disease. <table><tr><td>Blood Pressure</td><td>Physical Activity</td><td>Cholesterol Level</td><td>Heart Disease</td></tr><tr><td>low</td><td>medium</td><td>medium</td><td>NO</td></tr><tr><td>high</td><td>medium</td><td>high</td><td>YES</td></tr><tr><td>medium</td><td>low</td><td>medium</td><td>YES</td></tr><tr><td>low</td><td>medium</td><td>low</td><td>NO</td></tr><tr><td>high</td><td>low</td><td>medium</td><td>YES</td></tr><tr><td>high</td><td>high</td><td>medium</td><td>NO</td></tr><tr><td>medium</td><td>high</td><td>low</td><td>NO</td></tr><tr><td>medium</td><td>medium</td><td>high</td><td>YES</td></tr><tr><td>low</td><td>high</td><td>low</td><td>NO</td></tr></table> | 5 | CO1 | 2 |
| 2. | a) | Identify the differences between Biological Neuron and Artificial Neuron. | 2 | CO2 | 3 |
| | b) | Solve a given problem using back-propagation algorithm and perform the updated weight of $W_{35}$.(Use sigmoid activation function $=1/1+e^{-x}$)  | 3 | CO2 | 3 |
| 3. | | Apply Naïve Bayes Algorithm to find whether the person has flu or not <table><tr><td>chills</td><td>runny nose</td><td>headache</td><td>fever</td><td>flu?</td></tr><tr><td>Y</td><td>N</td><td>Mild</td><td>Y</td><td>N</td></tr><tr><td>Y</td><td>Y</td><td>No</td><td>N</td><td>Y</td></tr><tr><td>Y</td><td>N</td><td>Strong</td><td>Y</td><td>Y</td></tr><tr><td>N</td><td>Y</td><td>Mild</td><td>Y</td><td>Y</td></tr><tr><td>N</td><td>N</td><td>No</td><td>N</td><td>N</td></tr><tr><td>N</td><td>Y</td><td>Strong</td><td>Y</td><td>Y</td></tr><tr><td>N</td><td>Y</td><td>Strong</td><td>N</td><td>N</td></tr><tr><td>Y</td><td>Y</td><td>Mild</td><td>Y</td><td>Y</td></tr></table> **Data Samples: X= (Chills='Y', Runny Nose='N', Headache='No', Fever='Y', Flu=?)** | 5 | CO2 | 3 |