**R17**

**Code No: 844AC**

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD**
**MCA IV Semester Examinations, October/ November - 2020**
**MACHINE LEARNING**

Time: 2Hours                                                                                    Max.Marks:75

**Answer any five questions**
**All questions carry equal marks**
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1.      Construct decision tree for the training examples given in the table for **Play tennis** domain using Gain Ratio algorithm. Show clearly formulae used and calculations done at each stage for building the decision tree using the algorithm.                    [15]

| Outlook | Temp | Humidity | Windy | Playtennis |
|---------|------|----------|-------|------------|
| Sunny | 75 | 70 | true | play |
| Sunny | 80 | 90 | true | no play |
| Sunny | 85 | 85 | false | no play |
| Sunny | 72 | 95 | false | no play |
| Sunny | 69 | 70 | false | play |
| Overcast | 72 | 90 | true | play |
| Overcast | 83 | 78 | false | play |
| Overcast | 64 | 65 | true | play |
| Rainy | 81 | 75 | false | play |
| Rainy | 71 | 80 | true | no play |
| Rainy | 65 | 70 | true | no play |
| Rainy | 75 | 80 | false | play |
| Rainy | 68 | 80 | false | play |

2.      Write the ID3 algorithm for Decision tree learning.                                 [15]

3.      Write the derivation of Back propagation Learning Rule.                          [15]

4.      Write the Back propagation Learning Algorithm for Multi layer networks.     [15]

5.      Write following algorithms:
        a) Gibb's Algorithm          b) EM algorithm                                        [15]

6.      Explain the working of Bayesian belief networks.                                   [15]

7.      Explain the evaluation problem of HMMs.                                           [15]

8.      Explain the Inductive-Analytical approaches to learning.                        [15]

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