Program: Master of Computer Applications

Curriculum Scheme: MCA 2 year Course

Examination: MCA First Year Semester - II

Course Code: _MCA22_and Course Name: Artificial Intelligence and Machine Learning

Time: 2 HRS Max. Marks: 80

Section I - MCQS (40 Marks) – 40 Minutes

Section II – Subjective (40 Marks) – 80 Minutes

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SECTION II

Q1. Solve any **four** questions out of **six** which carry 5 marks each respectively.

20 marks

1. Write a short note on Alpha beta search algorithm
2. Explain PEAS representation with example
3. What is the significance of ensemble methods? Discuss any three ensemble methods.
4. Explain Principal Component Analysis.
5. Write a note on Support Vector Machine.
6. Explain Hill Climbing algorithm

Q2 Solve any **two** questions out of **three** which carry 10 marks each respectively. -

20 marks

1. Implement OR function with binary inputs and bipolar targets using perceptron training algorithm for 1 epoch.

   The initial values of the weights and bias are taken as zero. Also the learning rate is 1 and the threshold is 0.2. Activation function is

$$y = f(y_{in}) = \begin{cases} 1 & \text{if } y_{in} > \theta \\ 0 & \text{if } -\theta \le y_{in} \le \theta \\ -1 & \text{if } y_{in} < -\theta \end{cases}$$

2. Explain Expectation-Maximization algorithm with an example.
3. Explain the K-nearest neighbor algorithm with an example.

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