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BMS College of Engineering, Bangalore-560019

(Autonomous Institute, Affiliated to VTU, Belgaum)

May 2017 Semester End Main Examinations

Course: Artificial Intelligence **Duration: 3 Hours**
Course Code: 16CS6DEAIN **Max Marks: 100**
Date: 19.05.2017

Instructions: Answer FIVE FULL questions, choosing one from each unit.

UNIT - 1

1. a) Differentiate between utility based and learning based agents. 10
   b) For each of the following activities, give a PEAS description of the task environment and characterize it in terms of the properties of the task environment. 10
   i)Shopping for used AI books on the Internet.
   ii) Playing soccer.

UNIT - 2

2. a) Explain the steps involved in convertion of First –Order Logic to CNF 10
   b) Translate the following English statements to First–Order Logic and convert each to CNF 10
   i) Every gardener likes the sun.
   ii) You can fool some of the people all of the time.
   iii) All purple mushrooms are poisonous.
   iv) Horses are faster than dogs.

UNIT - 3

3. a) Define learning. Explain types of learning with suitable examples. 8
   b) Develop the decision tree learning algorithm and illustrate how entropy is used to choose the attributes in decision tree learning. 12

OR

4. a) Demonstrate ensemble learning using Adaboost. 10
   b) The table provides a classification for a data set of X Y pairs 10

X	Y	Class
T	T	+
T	F	-
T	F	-
T	T	+
F	T	-

i) Calculate the entropy for this classification.
ii) Calculate the information gain for X and Y

UNIT - 4

5.	a)	Explain Bayesian prediction method using posterior probabilities.	10
	b)	Derive the expression for the parameters of discrete models using maximum likelihood parameter learning.	10

OR

6.	a)	Develop the algorithm for an exploratory Q-learning algorithm.	10
	b)	Explain the working of a passive reinforcement learning agent using temporal difference.	10

UNIT - 5

7.	a)	Outline and explain the Forward Chaining Algorithm for First-order Logic.	10
	b)	Given the following facts: The law says that it is a crime for an American to sell weapons to hostile nations. The country Nono, an enemy of America, has some missiles, and all of its missiles were sold to it by Colonel West, who is American. Prove using resolution, whether Colonel West is a criminal.	10

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