Subject Code: CS 4029   Duration: 3 hours
Subject: Machine Learning   Max. Marks: 100

Instructions
- All Questions are compulsory
- The Question paper consists of 2 sections - Part A contains 10 questions of 2 marks each. Part B consists of 5 questions of 16 marks each.
- There is no overall choice. Only Part B question include internal choice.

PART – A
(2 * 10 = 20 Marks)

1. Give example of well posed learning problems
2. How a learning system can be designed?
3. What is concept of decision tree representation? Explain with example.
4. Explain univariate trees with example.
5. What are the components of bayes optimal classifier?
6. Give examples of Gibbs algorithm.
7. What are the examples of Hypothesis space search?
8. What are the real-life examples of genetic algorithm?
9. Give overview and challenges of learning rule sets.
10. What is analytical learning?

PART – B
(16 * 5 = 80 Marks)

11. a) Explain with examples, reinforcement learning in context of learning task and Q-learning?   (8+8)

OR

b) With examples, explain instance-based learning for K-nearest neighbour.   (8+8)

12.a) What are the issues in decision tree learning for univariate trees?

OR

b) What is hypothesis space search? How it effects inductive bias?   (8+8)

13.a) Give examples and explanation of EM algorithm. Also prove its mathematical correctness.   (8+8)

OR

b) What are the Bayesian belief networks? Explain with mathematical examples.   (8+8)

14. a) Compare genetic algorithms with genetic programming.   (8+8)

OR

b) Give an account of models of evolution and learning.   (8+8)

15.a) Give overview and challenges of augment search operations in context of FOCL algorithm.   (8+8)

OR

b) Explain creation of KBANN algorithm. Also give examples in context of knowledge hypothesis.   (8+8)