

B.Tech IV Year II Semester (R13) Advanced Supplementary Examinations July 2017

**ARTIFICIAL INTELLIGENCE**  
(Electronics & Instrumentation Engineering)

Time: 3 hours

Max. Marks: 70

**PART - A**

(Compulsory Question)

\*\*\*\*\*

- 1 Answer the following: (10 X 02 = 20 Marks)
- State the advantages of heuristic search method.
  - What are the advantages and disadvantages of constraint satisfaction problem (CSP) compared with search algorithms such as A\* search, etc?
  - What is a semantic network?
  - What are the main advantages in keeping the knowledge base separate from the control module in knowledge based systems?
  - Compare expert system and traditional system.
  - Define Dempster-Shafer theory.
  - Compare supervised and unsupervised learning methods.
  - List the design issues of artificial neural networks.
  - Define mutation and crossover operations of genetic algorithm.
  - What is natural language processing?

**PART - B**

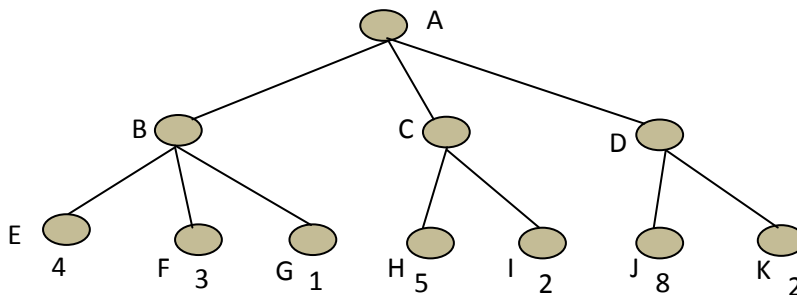
(Answer all five units, 5 X 10 = 50 Marks)

**UNIT - I**

- 2 State "Water jug problem" in terms of state-space search. Describe the state, the move-generator and the goal checker.

**OR**

- 3 Consider the following game tree shown in figure below in which the evaluation function values are shown below each leaf node. Assume that the root node corresponds to the minimizing player. Assume that the search always visits children left-to-right. Find which nodes will not be examined by the alpha-beta pruning algorithm.

**UNIT - II**

- 4 Explain knowledge representation using frames and semantic networks in detail.
- OR**
- 5 Give two examples of the following axioms that might appear in the knowledge base:
- Possibility axiom.
  - Successor-state axiom.

**UNIT - III**

6 Explain any one expert system architecture and reasoning technique used.

**OR**

7 Give a general definition of a Bayesian network and explain how a Bayesian network represents a joint probability distribution. Also explain the structure of Bayesian network.

**UNIT - IV**

8 Explain the concept of learning by induction with an example.

**OR**

9 Explain the steps involved in the training of multilayer feed forward neural network using back propagation learning.

**UNIT - V**

10 Consider fuzzy sets given by:

$$\bar{A} = \{(2,1), (4,0,3)(6,0,5)(8,0,2)\}$$

$$\bar{B} = \{(2,0,5), (4,0,4)(6,0,1)(8,1)\}$$

Perform union, intersection, difference and complement over fuzzy sets A and B.

**OR**

11 What is swarm intelligence? What problems do swarm intelligent systems solve?

\*\*\*\*\*