B TECH
(SEM-VIII) THEORY EXAMINATION 2017-18
ARTIFICIAL INTELLIGENCE

Time: 3 Hours   *Total Marks: 100*

Note: 1. Attempt all Sections. If require any missing data; then choose suitably.

SECTION A

1.   Attempt *all* questions in brief.   **2 x 10 = 20**

a) What are the different branches of Artificial Intelligence?
b) What do you understand by heuristics? How heuristic is used in "Hill Climbing and Steepest Hill Climbing algorithm"?
c) What is production system? Explain the various types of production system.
d) What are the different parameters used to evaluate a search technique?
e) Represent the following in predicate logic: "Anyone who loves everyone loves himself".
f) Why problem formulation must follow the goal formulation?
g) What is active and passive reinforcement learning?
h) How Forward chaining and backward chaining algorithm differ.
i) Give the algorithm for solving constraint satisfaction problems by local search?
j) How do you assure that an agent program is an intelligent agent program?

SECTION B

2.   Attempt any *three* of the following: **10 x 3 = 30**

a. Outline the components and functions of any basic kind of Agent programs.
b. Give A* algorithm with a suitable example. State limitations in this algorithm.
c. Why heuristic search is better than the blind search?
d. What is PEAS? Explain different agent types with their PEAS descriptions.
e. Briefly describe the meaning of knowledge representation and knowledge acquisition. What procedure is followed for knowledge acquisition? Explain.

SECTION C

3.   Attempt any *one* part of the following: **10 x 1 = 10**

(a)   What are the different parts of an Expert System? Explain in detail.
(b)   What is the difference between uninformed and informed search strategies?

4.   Attempt any *one* part of the following: **10 x 1 = 10**

(a)   Describe Alpha-Beta pruning and give the other modifications to minmax procedure to improve its performance.
(b)   How to write a program using PROLOG language? Write down the various data types in LISP language and their syntax

5. **Attempt any *one* part of the following:** 10 x 1 = 10

    (a)   For the below sentence draw a parse tree :
            "John wanted to go to the movie with Sally".

    (b)   Convert following sentence into predical logic and then prove "Marcus is dead":

            (i)   Marcus was a man

            (ii)   Marcus was a Pompeian

            (iii)   Marcus was born in 40 AD

            (iv)   All men are mortal

            (v)   All pompeians died when the volcano erupted in 1979

6. **Attempt any *one* part of the following:** 10 x 1 = 10

(a) What is probabilistic reasoning? Also describe the role HMM in probabilistic reasoning.

(b) Differentiate between breath first search and depth first search, also give an example.

7. **Attempt any *one* part of the following:** 10 x 1 = 10

    (a)   What do you mean by semantic analysis? Explain the use of compositional semantic approach.

    (b)   Write short notes on :
            i.   Speech recognition
            ii.   Pattern recognition