Printed Pages: 02 **Sub Code: ECS801**

Paper Id: **110225** **Roll No.** | | | | | | | | | | |

B.TECH
(SEM VIII) THEORY EXAMINATION 2018-19
ARTIFICIAL INTELLIGENCE

Time: 3 Hours ***Total Marks: 100***

Note: 1. Attempt all Sections. If require any missing data; then choose suitably.
2. Any special paper specific instruction.

SECTION A

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

a) How do you assure that an agent program is an intelligent agent program?
b) What do you understand by heuristics? How heuristic is used in "Hill Climbing and Steepest Hill Climbing algorithm"?
c) What is Min-max search procedure used for.
d) Give the algorithm for solving constraint satisfaction problems by local search?
e) What is the difference between Predicate logic and Prepositional logic.
f) Represent the following in predicate logic: "Everyone is loyal to someone".
g) Why problem formulation must follow the goal formulation?
h) What is a Turing Test.
i) How Forward chaining and backward chaining algorithm differ.
j) List the advantages of Depth First Search.

SECTION B

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

a) Explain the term "Artificial Intelligence". Also give the major characteristics of AI.
b) Briefly describe the meaning of knowledge representation and knowledge acquisition. What procedure is followed for knowledge acquisition? Explain.
c) Outline the components and functions of any basic kind of Agent programs.
d) How to write a program using PROLOG language? Write down the various data types in LISP language and their syntax
e) Describe the procedure for Iterative deepening Breadth First Search. Assume the tree configuration of your choice and tree depth is 2.

SECTION C

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

(a)
(b) Explain the main points of Reinforcement learning. Indicate how this enables an agent to act successfully in a given environment.

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) What is PEAS? Explain different agent types with their PEAS descriptions.

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

(a) Convert following sentence into predical logic :
- i. Mary loves everyone
- ii. Everyone loves everyone except himself.
- iii. Every student except George smiles.
- iv. Every student who walks talks.
- v. Someone loves everyone

(b) Convert following sentence into predicate 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) Discuss the performance of A* algorithm when the heuristic function under estimate or over estimate the values of states?

(b) What are the main steps of Hill Climbing Algorithm.

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

(a) Explain learning with complete data Naive Bayes Models and learning with hidden data-EM algorithm.

(b)
- i. Bayes classifier
- ii. K Nearest neighbour