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B.TECH
(SEM VII) THEORY EXAMINATION 2021-22
ARTIFICIAL INTELLIGENCE

Time: 3 Hours**Total Marks: 70****Note: 1.** Attempt all Sections. If require any missing data; then choose suitably.

SECTION A

1. Attempt all questions in brief. 2 x 7 = 14

- a. Compare propositional logic and predicate logic.
- b. What do you understand by Natural Language Processing?
- c. Write short note on Support Vector Machine.
- d. Represent sentence in the Predicate form “All the children like sweets”.
- e. Differentiate between local search and global search.
- f. Explain in brief the concept of reinforcement learning.
- g. Define forward chaining and backward chaining with example.

SECTION B

2. Attempt any three of the following: 7 x 3 = 21

- a. What is meant by the term Artificial Intelligence? How it is different from natural intelligence?
- b. Explain Steepest-ascent hill climbing algorithm. What are the problems with hill climbing algorithm?
- c. Define forward chaining and backward chaining with example.
- d. What is machine learning? Differentiate between supervised, unsupervised and reinforcement learning?
- e. Explain Nearest Neighbor rule used for classification.

SECTION C

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

- (a) What is an intelligent agent? Discuss any two types of intelligent agents.
- (b) What is “over fitting”? How do we overcome over fitting?

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

- (a) What is Bayesian reasoning? What does a Bayesian network represent? Explain.
- (b) What is pattern recognition? Explain various steps involved in the designing of a pattern recognition system with the help of a diagram.

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

- (a) What is the difference between knowledge representation and knowledge acquisition?
- (b) Explain Decision Tree with example.



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

- (a) What are the steps to define a problem? Explain also discuss various components of a problem.
- (b) Discuss various application domains of machine learning.

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

- (a) Consider the following sentences:
 - i. John likes all kinds of food.
 - ii. Apples are food.
 - iii. Children are food.
 - iv. Anything anyone eats and is not killed by is food.
 - v. Jack eats peanuts and is still alive.
 - vi. Jill eats everything jack eats.

Represent these sentences in predicate logic and prove that "John likes peanuts" using deduction or resolution.

- (b) Write short notes on:
 - i. PCA
 - ii. Hidden Markov Models