

Paper Id: **110730**Roll No: 

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**B.TECH.**  
**(SEM VII) THEORY EXAMINATION 2019-20**  
**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) Write the history of artificial intelligence.
- (b) Describe optimal problem with suitable example.
- (c) Define utility theory.
- (d) What are statistical learning models?
- (e) Define Bayes classifier.
- (f) Justify the use of searching in game.
- (g) Write the difference between the propositional and predicate logic.

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

- (a) Define Principle component analysis (PCA). Determine the 2 PCA of the following set of observations of 2-dimensional data having 5 examples

S. No.	X	Y
1	-1.4	-1.9
2	-0.5	-0.8
3	0.1	0.1
4	0.8	1.1
5	1.4	1.8

- (b) Explain about the Hill climbing algorithm with its drawback and how it can be overcome?
- (c) Describe the rules of inference in first order predicate logic with suitable example.
- (d) Define Reinforcement learning. Differentiate between the passive and active reinforcement learning. Is for evolution reinforcement learning an appropriate abstract model for human learning?
- (e) Explain the role of artificial intelligence in natural language processing.

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

- (a) Define intelligent agent. Explain various types agent programs with suitable example.
- (b) Explain computer vision in parlance to the artificial intelligence,

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

- (a) What is heuristic function? Differentiate between blind search and heuristic search strategies.
- (b) What is adversarial search? Write the steps for game problem formulation. State and explain minimax algorithm with tic-tac-toe game.

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

- (a) Differentiate between forward and backward chaining of inference with the help of example.

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- (b) Translate the following sentences in formulas in predicate logic and casual form:
- i. John likes all kind of food.
  - ii. Apples are food.
  - iii. Chicken is food.
  - iv. Anything anyone eats and is not killed by is food.
  - v. Bill eats peanuts and is still alive.
  - vi. Sue eats everything Bill eats.

6. **Attempt any one part of the following:**

7 x 1 = 7

- (a) Define machine learning. Explain supervised and unsupervised learning with suitable example. <https://www.aktuonline.com>
- (b) Explain the following in detail
  - i) Naïve Bayes model
  - ii) Learning with hidden data- EM algorithm

7. **Attempt any one part of the following:**

7 x 1 = 7

- (a) How Linear Discriminant Analysis is different from logistics regression? Explain Linear Discriminant Analysis (LDA) with suitable example.
- (b) What is clustering? Describe k-mean clustering technique.

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