Sub Code: RCS702

Paper Id: 110730 Roll No:

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 prepositional 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.

MANISH KUMAR JHA 16-Dec-2019 13:29:38 117.55.242.131

MANISH KUMAR JHA | 16-Dec-2019 13:29:38 | 117.55.242.131

(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.

(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.

MANISH KUMAR JHA | 16-Dec-2019 13:29:38 | 117.55.242.131

MANISH KUMAR JHA | 16-Dec-2019 13:29:38 | 117.55.242.131