CHAROTAR UNIVERSITY OF SCIENCE & TECHNOLOGY

Seventh Semester of B. Tech. Examination (CE) (Elective-II)
Fifth Semester of B. Tech. Examination (CE) (Elective-I)
Dec-2016
CE407/CE316 Artificial Intelligence (A.I.)

Date: 23.12.2016, Friday **Time: 10:00 a.m. To 01:00 p.m.** **Maximum Marks: 70**

Instructions:

1. The question paper comprises of two sections.
2. Section I and II must be attempted in separate answer sheets.
3. Make suitable assumptions and draw neat figures wherever required.
4. Rough work is to be done in the last page of main supplementary, please don't write anything on the question paper.
5. Indicate clearly, the option(s) you attempt along with its respective question no.
6. Figures to the right indicate marks.

SECTION-I

Q-1 **Answer the following questions.**

a. Give comparisons between human intelligence and computer intelligence? What is Turing Test? What is its significance? **3**

b. Compare the blind search techniques: BFS and DFS. Under which situation BFS is better in comparison with DFS? **3**

c. Compare ***Procedural*** v/s ***Declarative*** knowledge. **3**

d. Explain the difference between propositional logic and predicate logic (FOPL). **2**

Q-2

[A] State and prove Bay's Theorem. Justify the use of Bay's theorem in Bayesian Network. **4**

[B] Explain Horn clause and execution strategy of PROLOG program. **3**

[C] What are the basic knowledge representation issues? What are the considerations in knowledge representation? **5**

OR

Q-2

[A] Differentiate between ***Red Cut*** and ***Green Cut***. Give example for the same. **4**

[B] Describe good heuristic function for following: **4**

1. Blocks world problem
2. Theorem proving
3. Missionaries and Cannibals
4. Chess

[C] Convert these sentences ***to Propositional logic***. Using the logical rules, proof by resolution that "it is good to walk" is a logical consequence of the given information. **4**

1. It is raining, it is snowing or it is dry.
2. It is warm.
3. It is not raining.
4. It is not snowing.
5. If the weather is nice, then it is good to walk.
6. If the weather is dry and warm, the weather is nice.

Q-3

[A] Write short note on: an architecture of an ***Expert system***. **4**

[B] Explain in brief with all mathematical terms: Back (ward) Propagation Neural Network (BPNN) Learning Algorithm. What do you mean by gradient descent in it? **4**

[C] Draw the parse tree and write down the grammar rules for: 4
"John printed the .init file"

OR

Q-3

[A] Explain the principle of Means Ends Analysis approach for solving problems. 4

[B] Analyze the following problems with respect to the seven problem characteristics: 4

1. Chess
2. 8-puzzel
3. TSP
4. Missionaries and Cannibals

[C] What are the problems with basic Hill-Climbing search technique? Give possible solution for solving the problems. 4

SECTION-II

Q-4

1. Write a prolog program to find out maximum and minimum of two numbers, three numbers. 3 4
2. Write a program to add the element at the head and tail.
   e.g. ([a, b, c] [d, a, b, c, d])
3. What are the components of Artificial Intelligence (AI)? Explain production system in brief. 4

Q-5

[A] Why is NLP required? Explain the term pragmatics in context to NLP. Why is it the most difficult phase of NLP? 4

[B] Explain the significance of the following in AI: 4

1. A* algorithm
2. Best First Search algorithm
3. Forward and Backward Reasoning
4. Forward and Backward Chaining

[C] What is an Expert System? Compare it with traditional Software. 4

OR

Q-5

[A] In Alpha-Beta cutoff search procedure, specify the condition for Alpha and Beta cutoffs? 4

[B] Explain fully connected feed forward multilayer network (Neural Network). How to decide about number of hidden layer(s) and number of nodes in each hidden layer(s)? 4

[C] How the frames are organized? What are the advantages and disadvantages of frames and semantic nets? 4

Q-6

[A] What are seven problem characteristics? 9

OR

[A] Distinguish between *state space search* and *constraint satisfaction* technique. What are the termination conditions for *constraint satisfaction* technique? Trace the execution of the constraint satisfaction procedure in solving the crypt arithmetic problem: **CROSS + ROADS= DANGER.** 9

[B] Write a PROLOG program to generate family tree. 3

OR

[B] Compare Fuzzy logic with Binary logic. Give real world applications of the fuzzy logic. 3