CHAROTAR UNIVERSITY OF SCIENCE & TECHNOLOGY

Fifth Semester of B. Tech. Examination (CE) (Elective-I)
November -2018
CE316 Artificial Intelligence (A.I.)

Date: 29.11.2018, Thursday **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. In which context did Turing suggest his well-known test? Explain the Turing Test. 3

b. Explain the difference between blind search and heuristic search techniques. 3

c. Production system and control strategies are two approaches of problem solving. Discuss the important characteristics of production system and control strategies. 3

d. Explain fuzzy set theory in brief. 2

Q-2

[A] Compare Procedural v/s Declarative Knowledge. 4

[B] Prolog is based on FOPL but uses a restricted version of the clausal form. Justify the statement. 4

[C] Does the Hill-Climbing search always move towards the goal? What are the advantages and disadvantages of that? 4

Q-2 **OR**

[A] Will the following literals unify? If yes, then write the most general unified (mgu): 4

hate (x,y)
hate (marcus,z)

[B] Which are the factors that decide the choice of ***reasoning forward*** or ***reasoning backward***? 4

[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] Explain the Expert System Development Process. Draw the block diagram of a typical Expert System. 4

[B] What do you mean by ***Script***? Write a script for *Going to the movie*. 4

[C] Explain the term syntactic processing and semantic analysis in the context to NLP. 4

OR

Q-3

[A] Compare MLP (Multilayer Perceptron Networks) with (Single) Perceptron. 4

[B] Bayesian Network and Fuzzy Logic ate concerned with modeling uncertainty of the world. Can Bayesian Network and Fuzzy Logic be used interchangeably? Justify. Which are the differences between the two? 4

[C] Draw the **Conceptual Dependency (CD)** representation for the sentence: *John punched Bill.* 4

SECTION-II

Q-4

1. Write complete set of ranks in **PROLOG** to represent the relation *grand father*. 3
2. Write **PROLOG** program to search for an element 'X' in the list 'L' 4
3. What is the significance of planning in **AI**? Which are the main components of a *planning system*? 4

Q-5

[A] Why is **NLP** required? Which ate the problems with Natural Language Understanding? Which are the ambiguities present in the language? 4

[B] How does the **A*** algorithm work? Analyze the performance of **A*** Algorithm. 4

[C] Write a **PROLOG** program to add all elements of a given integer list. 4

OR

Q-5

[A] Describe briefly the frame based knowledge representation. Give an example. 4

[B] What are ***Perceptrons***? Describe how the *gradient descent* method is used in the context of ***Perceptrons***. 4

[C] Develop the ***parse tree*** for the sentence: ***Jack slept on the table.*** 4

Q-6

[A] What are seven problem characteristics? Describe them in brief. 8

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: **LOGIC + LOGIC= PROLOG** 8

[B] Differentiate between ***green cut*** and ***red cut*** using examples. 4

OR

[B] Why do game playing program work from a current to a goal state rather than backward from a goal? Which properties of a game might suggest using a backward strategy? 4