GANPAT UNIVERSITY
B. Tech Sem VII (CE/IT) Examination Nov-Dec 2012
CE 702/IT 702: Artificial Intelligence

TIME: 3 HOURS   MARKS: 70

Instructions: 1. Figures to the right indicate full marks of the question.
      2. All questions are compulsory.

SECTION: I

Q:1 (a) Explain the difference between ignorable and non ignorable problem [2] with suitable example.

(b) Discuss BFS with suitable Example. [4]

(c) Discuss the case where hill climbing algorithm fails. Discuss it with [6] Block world problem. Write the solution to overcome Failure.

OR

Q:1 (a) What is Artificial Intelligence? Discuss an application of Artificial [3] Intelligence in brief.

(b) Discuss DFS with suitable Example. [4]

(c) Describe the problem characteristics for 8-puzzle Problem. [5]

Q:2 (a) Write Predicate Logic for following Statement. [2]

  1. All Romans who know Marcus either hate Caesar or think that anyone who hates anyone is crazy.

  2. No people lives longer than 150 years.

(b) Solve and suggest the appropriate strategy for the following water-jug [5] problem. "You are given two jugs of capacity having 8 liters and 5 liters. You have to obtain 3 liters of water. There are no measuring markers on jugs."

(c) Discuss Resolution in Propositional Logic. [4]

OR

Q:2 (a) Discuss following terms. [3]
  1.   Problem space
  2.   Chronological backtracking
  3.   Semantic Net

(b) Prove Fuzzy Demorgan's Law: $(A \cap B) = (A^C \cup B^C)^C$ [3]

(c) What is problem Reduction? Explain AND-OR graph with suitable [5] example.

Q:3 (a) Write an output of the following programs.   [2]

1. predicates   2. Predicates
    info(string, string)   done
    start   loc(string, string)
    start:-   clauses
    info(Name, City),   done:-
    writef ("%-   loc(City, State)
    10%2\n",Name,City),   writef("%-10%2\n",City,State),
    fail.start.   fail,
    info("abc"," ahm").   done.
    info("def","mhsn").   loc("Jackson","ms"),
                                            loc("Washington","ds").

(b) Explain prolog data types in detail.   [3]

(c) What are predicates? Write an input and output predicates with suitable   [3]
    example.

(d) Write a program to rotate the list on the Left direction.   [4]

SECTION: II

Q:4 (a) What is constraint satisfaction? Solve following problem using   [8]
        constraint satisfaction.

                    C R O S S
                 + R O A D S

                    D A N G E R

(b) Writ e a program to Add two lists, only if number of elements are in   [4]
    both the List are same.

OR

Q:4 (a) What is constraint satisfaction? Solve following problems using   [8]
        constraint satisfaction.

                    S E N D
                 + M O R E

                    M O N E Y

(b) Write a program to check if the specified element is a member of the   [4]
    specified list or not.

Q:5 (a) Solve following example using Fit-Violation Theorem. [3]

	X1	X2	X3	X4	X5
A	0.2	0.6	0.7	0.9	0
B	0.3	0.5	0.2	0.8	1

(b) How Means-End Analysis overcome the limitation of other search procedures? Write Means-End Analysis algorithm and explain it with suitable example. [6]

(c) Discuss: Branch and Bound Technique [2]

OR

Q:5 (a) What is resolution? Using Following Facts answer the questions, "Did Marcus hate Caeser?"(using resolution) [6]

1. Marcus was a man.
2. Marcus was a Pompeian.
3. All Pompeians were Romans.
4. Caesar was a Ruler.
5. All Romans were either loyal to Caesar or hated him.
6. Everyone is loyal to someone.
7. People only try to assassinate rulers they are not loyal to.
8. Marcus tried to assassinate Caesar.

(b) Writ e a program to Add two lists, only if number of elements are in both the List are same. [4]

(c) What is fact? [1]

Q:6 (a) Write a short note on "Expert System" [4]

(b) What is Frame? Why it is used in AI? Explain it with suitable example. [3]

(c) Consider the following sentences: [5]
1. John like all kinds of food.
2. Apples are food.
3. Chicken is food.
4. Anything anyone eats and isn't killed by is food.
5. Bill eats peanuts and is still alive.

Give following answers.

1. Translate these sentences into formulas in predicate logic.
2. Prove that John likes peanuts using backward chaining.
3. Convert the formulas of part (a) into clause form.
4. Prove that john likes peanuts using resolution.
5. Use resolution to answer the question, "What food does Sue ear?

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