UPES

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES

End Semester Examination, December 2017

Program: M.Tech CSE (Artificial Intelligence)	**Semester – 1st**
Subject (Course): Artificial Intelligence & Expert Systems	**Max. Marks : 100**
Course Code : CSAI7003	**Duration : 3 Hrs**
No. of page/s : 2	

Section A: Answer all Questions   4X5M=20 M
1. How will you represent facts in propositional logic with an example?
2. Write Unification algorithm.
3. Differentiate Informed and uninformed search strategies with example
4. Explain expert system work at universities and research organizations

Section B: Answer all Questions   5X12M=60 M
5. Illustrate how to define a problem as a state space search with an example?
6. Discus the importance of Knowledge based systems. Explain Knowledge representation methods?
7. Explain resolution inference rule? If $¿(13) ∧ (−125) ∧ (−14) ∧ (−1−4) ∧ (1−2). P$rove φ → (3 5) using resolution inference rule.
8. Explain in detail
   a. Non monotonic reasoning
   b. Fuzzy logic
9. How activation function is very important in Neural Networks model design? Write activation functions of Neuron

Section C: Answer all Questions   1X20M=20 M

10. A bank clerk wants to approve loans for customers. He collects the basic information about the customer, which is represented as a set of variables as follows:
    APP (the appraisal on the collateral is greater than the loan amount)
    RATING (The applicant has a good credit rating)
    INC (The applicant's income exceeds his expenses)
    BAL (The applicant has an excellent balance sheet)
    Derived variables
    OK (The loan should be approved)
    COLLAT(The collateral for the loan is satisfactory)
    PYMT (The applicant is able to make the loan payments)
    REP (The applicant has a good financial reputation)

    Using the above domain Knowledge, construct a rule-based expert system for loan application case as a parse tree

                         (OR)
    Convert the following statements in Predicate logic
       Marcus was a man.

Marcus was a Pompeian.
All Pompeiians were Romans.
Caesar was a ruler.
All Romans were either loyal to Caesar or hated him.
Everyone is loyal to someone.
People only try to assassinate rulers they are not loyal to
Marcus tried to assassinate Caesar.
Apply the above Predicate logic statements answer, "Was Marcus loyal to Caesar"?

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Section A: Answer all Questions 4X5=20 M
1. Specify the components & limitations of expert systems.
2. Brief the components of first order predicate logic.
3. What do you mean by reinforcement learning, when it is used?
4. List and discuss two potentially negative effects on society of the development of artificial intelligence technologies.

Section B: Answer all Questions 5X12=60 M
5. Explain Water Jug Problem using state space tree?
6. Explain Perceptron's training algorithm?
7. Explain methods for Knowledge representation.
8. Compare and contrast Breadth First Search and Depth first Search. Illustrating the advantages and disadvantages of each. What is Best first search? Write the algorithm and Explain.
9. Explain how non Monotonic reasoning is done in Truth maintenance system with suitable example.

Section C: Answer all Questions 1X20=20 M

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Using the above domain Knowledge, construct a rule-based expert system for loan application case as a parse tree

(OR)

A). Explain about clausal form and write the steps of conversion procedure with suitable examples.

B). Explain the methods to deal with Uncertain knowledge in problem solving?