LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

M.Sc. DEGREE EXAMINATION – COMPUTER SCIENCE

THIRD SEMESTER – NOVEMBER 2015

CS 3950 - ARTIFICIAL INTELLIGENCE

Date : 11/11/2015 Dept. No. [ ] Max. : 100 Marks
Time : 09:00-12:00

Section – A

Answer all Questions (10 X 2 == 20 Marks)

1. Define Intelligent Agent.
2. Mention the properties of Task Environment.
3. How do you calculate $f(n)$ in A* algorithm? Explain each term.
4. Define Constraint Satisfaction Problem.
5. List the five connectives in Propositional Logic.
6. Show that $(P \rightarrow Q) V (Q \rightarrow P)$ is a tautology.
7. List any four learning forms.
8. State the uses of Neural Networks.
9. Parse: I am the true vine.
10. What is information extraction?

Section – B

Answer all Questions (5 X 8 == 40 Marks)

11 a) Explain the depth first search algorithm with an example.
  Or
  b) Explain the breadth first search algorithm with an example.

12 a) Explain A* algorithm with an illustration.
  Or
  b) Illustrate Min-max Algorithm.

13 a) Give resolution proof for the following: ***Curiosity killed the cat***

  a. $\forall x \, [\forall y \, Animal(y) => Loves(x,y)] => [\exists y \, Loves\,(y,x)]$
  b. $\forall x \, [\forall y \, Animal(y) \wedge Kills(x,y)] => [\exists z \, \neg Loves\,(z,x)]$
  c. $\forall x \, Animal(x) => Loves(Jack,x)$
  d. $Kills(Jack,Tuna) \vee Kills(Curiosity, Tuna)$
  e. $Cat(Tuna)$
  f. $\forall x \, Cat(x) => Animal(x)$
  g. **Goal**: $Kills(Curiosity,Tuna)$

  Or

b) Give first order logical representation of the following statements

     1) India is a country.
     2) If today is hot and humid then there will be rain.
     3) Smoking kills everyone who smokes.
     4) If there is smoke then there is fire.
     5) Raja or Ravi has to complete the work.

14 a) Discuss about the various forms of learning.
                        Or
   b) Explain inductive learning in detail.

15 a) Explain a formal grammar for a fragment of English.
                        Or
   b) Discuss about information retrieval.

Section – C

Answer any TWO Questions   **(2 X 20 == 40 Marks)**

16 a) Explain different rational agents with neat diagrams.
   b) Explain alpha-beta pruning with an example.

17 a) Write the First Order Logic of the following statements and use Resolution
      Proof to prove that 'Fido will die'.
       1. Every dog is an animal.
       2. Fido is a dog.
       3. All animals will die.
   b) Explain neural network with a mathematical model.

18 a) Give parse tree representation of the following statements:
        i)   The boss at soup at home and went to his office.
        ii)   If x=5 then y=1 else y=2.
        iii)   The cyclone hit the city and left it devastated.
   b) Illustrate CSP (Constraint Satisfaction Problem) using Missionary Cannibal
     Problem.

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