Total No. of Questions : 12] [Total No. of Pages : 3

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[3664]-359

B.E. (Information Technology)

ARTIFICIAL INTELLIGENCE (414451)

(Elective-II) (2003 Course) sem II

Time : 3 Hours] *[Max. Marks : 100*

Instructions :

1) *Answers to the two sections should be written in separate books.*
2) *Neat diagram must be drawn wherever necessary.*
3) *Figures to the right indicate full marks.*
4) *Use of logarithmic tables, slide rules and electronic pocket calculator is allowed.*
5) *Assume suitable data, if necessary.*

SECTION - I

Q1) a) Define Artificial intelligence. What is Turing Test and what was it intended to accomplish? **[8]**

b) Best First search uses both an OPEN list and a CLOSED list. Describe the purpose of each for the Best-First algorithm. Explain with suitable example. **[8]**

OR

Q2) a) Hill climbing is a standard iterative improvement algorithm similar to greedy Best-First search. What are the primary problems with hill climbing? **[8]**

b) Describe the essence of a constraint satisfaction problem. What are some of the major applications of constraint satisfaction search? **[8]**

Q3) a) What is predicate logic? Describe the advantages of predicate logic over propositional logic. **[8]**

b) Briefly explaining Truth Maintenance system. Explain with suitable example how TMS allows truth values to be changed during reasoning. **[8]**

OR

Q4) a) Represent each of the following sentences in first-order logic and then convert each one of them into Well Formed Formula (WFF). **[8]**

i) A whale is a mammal.

ii) John knows Jane's father.

iii) If it's raining, then the ground is wet.

iv) If the switch is on and the light is off then the light-bulb is broken.

v) All computers have a processor.

P.T.O.

b) What is resolution? Explain resolution is predicate logic with suitable example. [8]

Q5) a) Explain the major modules of a natural language interpretation system and explain their functions. [9]

b) What is understanding? Explain understanding as constraint satisfaction with suitable example. [9]

OR

Q6) a) There are many important relationships that may hold between phrases and parts of their discourse context. Explain the following terms with respect to pragmatic analysis :- [9]

i) Identical entities
ii) Parts of action
iii) Elements of sets
iv) Causal chains.

b) Draw and explain types of junction in a line drawing in Waltz algorithm. Also show all permissible labeling at those junctions. [9]

SECTION - II

Q7) a) What are the components of a planning system? Explain briefly how these components can be implemented. [8]

b) Write brief note on i) STRIPS, ii) Least Commitment Strategy. [8]

OR

Q8) a) What is planning? How block world problem helps up to study planning? Give suitable example. [8]

b) Write brief note on i) Hierarchical Planning, ii) Non-Linear planning. [8]

Q9) a) What is learning? Explain Failure-driven learning in details with suitable example. [8]

b) Explain Artificial Neural Networks (ANN). Also explain how ANN mimics the human brain working. [8]

OR

*Q10)*a) What is Supervised Learning and unsupervised Learning? Explain the benefits to Neural Networks. [8]

b) What is Inductive learning? Also explain Winston's learning program. [8]

*Q11)*a) What is Prolog? How Prolog answer user queries? [9]

b) Explain architecture of expert system and discuss how expert system technique helps in building an efficient system. [9]

OR

*Q12)*a) Identity and describe two good application areas for expert system within a University environment. [9]

b) Explain how Prolog copes with searching through a number of clauses, matching, unification and resolution. Also consider the following Prolog program code and write the output of the following queries :- [9]

What will be output of the following queries :-

```
.? proud(shreyash)
.? proud(X)
.? parent(ajay,X)
    predicates
        proud(symbol).
        parent(symbol,symbol).
        newborn(symbol).
        father(symbol,symbol).
        mother(symbol,symbol).
    clauses
        proud(X):-parent(X,Y),newborn(Y).
        parent(X,Y):- father(X,Y).
        parent(X,Y):- mother(X,Y).

        father (ajay, shreyash).
        mother(smita, shreyash).
        newborn(shreyash)
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