B.Tech (Sem. IV) (Main) Examination, May/June.-2011

Computer Engineering

6CS6.2 ARTIFICIAL INTELLIGENCE

: 3 Hrs.

[Total Marks: 80

Min. Passing Marks: 24]

Instructions to Candidates:

*Attempt any **five** questions. Selecting one question from **each** unit. All questions carry **equal** marks. (Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly).*

Unit-I

(a) Explain the production systems with suitable examples. Write Algorithms for DFS and BFS as control structure used in a production system. What are the advantages of DFS over BFS? [8]

(b) Explain the steepest Hill Climbing techniques. Also explain the various potential problems associated with Hill climbing. How we can overcome these problems? [8]

OR

(a) Trace the constraint satisfaction procedure solving the following cryptarithmetic problem: [5]

```
    E A T
+ T H A T
-----------
A P P L E
```

(b) Write algorithm for A* Search techniques. Taking suitable example show, it is better than greedy Best first search technique. [6]

(c) Explain the concept of AND-OR Graph search with suitable example. [5]

Q.2 (a) Explain the various requirements of an appropriate knowledge representation scheme.
[5]

(b) Explain the Resolution principle by taking suitable example. Write the steps followed in the resolution.
[6]

OR

Q.2 (a) Explain why predicate logic is better approach than propositional logic for knowledge representation. Given some examples also.
[6]

(b) Explain why Close World Assumption (CWA) to deal with incomplete knowledge with suitable examples.
[5]

(c) Write the steps to convert a predicate calculus expression into clausal form. Applying these steps convert the following into clausal form:

$(\neg P \wedge Q) \wedge (P \wedge \neg Q) \wedge S$
[6]

Unit-III

Q.3 (a) Explain the theory of Conceptual Dependency. Using diagram, show a conceptual dependency representation of the following sentence:

"While going home, I saw a frog"
[6]

(b) Is it possible to compute $P(A/\sim B)$ when you are only given $P(A)$. $P(B/A)$ and $P(B)$? Explain your answer.
[5]

(c) How fuzzy logic is different from conventional binary logic. Explain it with suitable example.
[5]

OR

(a) Explain the concept of Script as a structure describing the sequences of events. Construct a script of any suitable examples. [6]

(b) Prove that if A and B are independent $P(B/A) = P(A)$. (Note that A and B are independent if and only if $P(A \& B) = P(A). P(B)$. [5]

(c) Explain the concept of Semantic Net in knowledge representation. Using diagram, show a Semantic Net representation of the following sentence:

"John gave the book to Mary" [5]

Unit-IV

(a) Explain the Minimax search procedure used in game playing programs with suitable example. [6]

(b) Explain the Morphological analysis in Natural Language processing with suitable example. [6]

(c) Explain the goal stack planning approach for solving the compound goals. [5]

OR

(a) What is Alpha-Beta pruning strategy? Explain its need with suitable example. [6]

(b) Explain the pragmatic analysis in natural Language processing with suitable example. [5]

(c) Explain the block world problem by taking suitable examples. [5]

Unit-V

Q.5 (a) Explain explanation based learning by taking suitable example. [5]

(b) Explain the single layer preceptron model of neural network. What are the limitations of this model. [6]

(c) Explain the How knowledge is acquired in expert system taking suitable example. [5]

OR

Q.5 (a) How "learning by taking advice" is different from "learning by example". Explain it with suitable example. [5]

(b) Explain the concept of hopfield neural network with suitable sketch. What are the applications of How field neural network? [5]

(c) What is the expert system? With block diagram, explain each module of it. [6]