

6E3207

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 cryptarithmic problem: [5]

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+ T H A T
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A P P L E

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

Unit-III

- Q.3 (a) Explain the theory of Conceptual Dependency. Using diagram, show a conceptual dependency representation of the following sentence: [6]
- “While going home, I saw a frog”
- (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 $P(A \& B) = P(A) \cdot P(B)$. [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 perceptron 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 Hopfield neural network? [5]
- (c) What is the expert system? With block diagram, explain each module of it. [6]