

6/H-73 (viii)(b) (Syllabus-2015)

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(May/June)

COMPUTER SCIENCE

(Honours)

(Artificial Intelligence)

(CS-602 BT)

Marks : 75

Time : 3 hours

*The figures in the margin indicate full marks
for the questions*

UNIT—I

1. (a) Define artificial intelligence. List any two applications of AI. 3+4=7
- (b) Write a short note on iterative deepening search. 5
- (c) What do you understand by a state space representation of a problem? 3

OR

2. (a) How does an AI problem differ from a regular problem? 3

(2)

- (b) What is the meaning of the term 'uninformed search'? 2
- (c) Give the algorithms for depth first search and breadth first search. 5+5=10

UNIT—II

3. Define heuristic search technique. How is Simple Hill Climbing different from Steepest-ascent Hill Climbing? Explain three problems associated with Steepest-ascent Hill Climbing search and how these can be dealt with. 1+2+6+6=15

OR

4. (a) What is a constraint satisfaction problem? List two problems that can be represented as a constraint satisfaction problem. 3+2=5
- (b) Explain the steps of the A^* algorithm and compare its performance with best first search. 8+2=10

UNIT—III

5. (a) Explain the following terms with respect to predicate logic : 2+2+2+3+3=12
- (i) Domain or universe of discourse
- (ii) Universal quantifier

(3)

- (iii) Existential quantifier
- (iv) Logical formula in predicate logic
- (v) Clausal form

- (b) Discuss forward reasoning and backward reasoning. 3

OR

6. (a) Represent the following English sentences as predicate logic sentences :

2×5=10

- (i) All men are mortal.
- (ii) Some students are honest.
- (iii) If the sky is cloudy then it will rain.
- (iv) The color of the sky is blue.
- (v) Not every bear likes honey.

- (b) Write a short note on unification. 5

UNIT—IV

7. (a) What is an expert system? What is the significance of acquiring new knowledge and updating old knowledge in the context of an expert system? 2+5=7
- (b) Explain the steps involved in a natural language understanding process. 8

(4)

OR

8. (a) List two capabilities that rote learning systems must possess to handle complex learning systems. 5
- (b) Explain how reasoning with knowledge can be used in an expert system. 5
- (c) Write a note on semantic analysis step of natural language processing. 5

UNIT—V

9. (a) Show how the rule if (A and B and C) or (D and E) then F can be represented in PROLOG. 3
- (b) Explain, with an example, how lists can be used in PROLOG. Give five operations that can be performed on a list with an example of each. 2+10=12

OR

10. (a) What are the rules for naming variables and in PROLOG? What is an anonymous variable in PROLOG? 3+2=5

(5)

- (b) Write PROLOG statements (facts/rules) for the following English statements : 2×5=10
- (i) John likes pasta.
- (ii) Everybody likes pasta.
- (iii) John likes pizza or John likes pasta.
- (iv) John likes pizza if John likes pasta.
- (v) John likes pizza and John likes pasta.
