MASTER OF COMPUTER APPLICATION
FOURTH SEMESTER
ARTIFICIAL INTELLIGENCE
MCA-402.1
[USE OMR SHEET FOR OBJECTIVE PART]

SET A

Duration: 3 hrs.

Full Marks: 70

(**Objective**)

Time: 30 mins.

Marks: 20

Choose the correct answer from the following:

$1 \times 20 = 20$

1. Hill-Climbing approach struck for the following reasons:
   a. Local Maxima
   b. Ridges
   c. Plateaus
   d. All of these

2. Which of the following is a component of an expert system?
   a. Explanation module
   b. Knowledge base
   c. Natural Language interface for the user
   d. All of these

3. Which is level by level searching?
   a. Depth First Search
   b. Breadth First Search
   c. Hill Climbing
   d. None of these

4. Which of the followings is the first expert system?
   a. MYCIN
   b. DENDRAL
   c. PROSPECTOR
   d. CASNET

5. What should be done in Depth First Search?
   a. Expand the node that is on the least-cost solution path
   b. Expand the node that is closest to the goal
   c. Expand the deepest unexpanded node
   d. None of the above

6. An expert system differs from conventional computer system is that expert systems:
   a. Use knowledge
   b. Use symbolic representation for knowledge
   c. Reason with meta knowledge
   d. All of these

7. Which of the followings programming language is for AI?
   a. BASIC
   b. FORTRAN
   c. COBOL
   d. LISP

8. The basic building blocks of LIPS are:
   a. Atom
   b. List
   c. String
   d. All of these

9. LIPS was developed by.........................
   a. John McCarthy
   b. Marvin Minsky
   c. Alan Turing
   d. Allen Newell and Herbert

10. Which of the following statements is true in case of rule based system?
    a. Knowledge is stored in database
    b. Knowledge is stored in the database in encrypted form
    c. Knowledge is represented in the form of rule
    d. All of these

11. In ANN , "NN" is based on:
    a. Brain cell
    b. Blood cell
    c. Both
    d. None

12. The links between the input and activation functions are called:
    a. Synaptic weights
    b. Bias weights
    c. Activation weights
    d. None

13. The activation function receives input from:
    a. Summing junction
    b. Synapse
    c. Activation weights
    d. Bias only

14. Linear combiner is also called as:
    a. Adder
    b. Subtractor
    c. Divisor
    d. Multiplier

15. What is a squashing function?
    a. Adder function
    b. Multiplier function
    c. Activation function
    d. All

16. The threshold activation range is:
    a. Any valve from 0 to 1
    b. Any valve from -1 to +1
    c. Only 0 and 1
    d. Any valve from -0.5 to 0.5

17. The sigmoid activation range is:
    a. Any valve from 0 to 1
    b. Any valve from -1 to +1
    c. Only 0 and 1
    d. Any valve from -0.5 to 0.5

18. In sigmoid function, what is mean by parameter 'a'?
    a. Slope function
    b. Slope parameter
    c. Rate of learning
    d. Weight factor

19. In multi layer feed forward network, middle layer is?
    a. Activation layer
    b. Hidden layer
    c. Output layer
    d. Recurrent layer

20. In a recurrent neural network, which of the following is true?
    a. There is no feedback loop
    b. There is feedback loop
    c. There is no output layer
    d. There is no input layer

-- --- --

(Descriptive)

Time : 2 hr. 30 mins.   Marks : 50

[Answer question no.1 & any four (4) from the rest]

1. a) What is Turing Test?   3
    b) What the ELIZA system? Describe its characteristics.   2+5=7

2. a) What is a symantic net? What are the parts of a semantic net?   2+3=5
    b) What are the different semantic net representations?   5

3. Comet is-a horse
    Prancer is-a horse
    Coment is-a-parent-of Dasher
    Coment is-a-parent-of Prancer
    Prancer is fast
    Dasher is-a-parent-of Thunder
    Thunder is fast
    Thunder is-a horse
    Dasher is-a horse

    Given the parent rule:
    if ?x is-a horse
        ?x is-a-parent-of ?y
        ?y is fast
    then ?x is valuable
    a) Using DFS, find which horse is fast?   6
    b) Using Rules-chaining draw the logic diagram to test "comet is   4
       valuable"?

4. Using planning semantics, plan the movement of four blocks A, B, C, D
    according to the question.
    Initial:
    1. Block A on top of Block C
    2. Block D on top of Block B
    3. Block C, B on table.

    a) Show the operators use to plan the block movements.   4
    b) Draw the links established to achieve the following goal: 6
       Goal:
    1. Block A on top of Block B
    2. Block B on top of Block C
    3. Block C and Block D on table

5. What is an expert system? What are the characteristics of expert   2+5+3=10
    system? Give some application area of expert system.

6. What is rule-based system? Explain the architecture of rule-based   2+8=10
    system with diagram.

7. What do you mean by Beam search? Explain briefly. State the conditions under what each of the following search technique is good. DFS, BFS, Nondeterministic search, Hill climbing, Beam search and Best-first search. 3+7=10

8. What is game tree? Explain briefly. What is alpha-beta principle? State the formula for finding the number of static evaluation is needed for discovering the best move in an optimally arranged game tree with this alpha-beta principle. Find the number of static evaluation is required for a game tree with branching factor 3 and depth is 3. 3+1+2+4=10

= = *** = =