Write the following information in the first page of Answer Script before starting answer

ODD SEMESTER EXAMINATION: 2020-21

Exam ID Number_____

Course_____   Semester_____

Paper Code_____Paper Title_____

Type of Exam: _____   (Regular/Back/Improvement)

Important Instruction for students:

1. Student should write objective and descriptive answer on plain white paper.
2. Give page number in each page starting from 1ˢᵗ page.
3. After completion of examination, Scan all pages, convert into a single PDF, rename the file with Class Roll No. (2019MBA15) and upload to the Google classroom as attachment.
4. Exam timing from 10am – 1pm (for morning shift).
5. Question Paper will be uploaded before 10 mins from the schedule time.
6. Additional 20 mins time will be given for scanning and uploading the single PDF file.
7. Student will be marked as ABSENT if failed to upload the PDF answer script due to any reason.

MASTER of COMPUTER APPLICATION
FIFTH SEMESTER
ARTIFICIAL INTELLIGENCE
MCA - 504.4

Duration : 3 hrs.   **Full Marks : 70**

(_PART-A: Objective_)

Time : 20 min.   **Marks : 20**

Choose the correct answer from the following: _1×20=20_

1. LISP was created by?
   a. John McCarthy   b. Marvin Minsky
   c. Alan Turing   d. Allen Newell and Herbert Simon

2. A heuristic is a way of trying _____
   a. To discover something or an idea embedded in a program
   b. To search and measure how far a node in a search tree seems to be from a goal
   c. To compare two nodes in a search tree to see if one is better than the other is
   d. All of the mentioned

3. Strong Artificial Intelligence is _____
   a. the embodiment of human intellectual capabilities within a computer
   b. a set of computer programs that produce output that would be considered to reflect intelligence if it were generated by humans
   c. the study of mental faculties through the use of mental models implemented on a computer
   d. all of the mentioned

4. Which algorithm is used in the Game tree to make decisions of Win/Lose?
   a. Heuristic Searh Algorithm   **b.** DFS/ BFS algorithm
   c. Greedy Search Algorithm   **d.** Min/Max Agorithm

5. Which of the following, is a component of an expert system?
   a. inference engine   **b.** knowledge base
   c. user interface   **d.** all of the mentioned

6. Knowledge and reasoning also play a crucial role in dealing with _____ environment.
   a. Completely Observable   **b.** Partially Observable
   c. Neither Completely nor Partially   **d.** Only Completely and Partially
       Observable   Observable

7. Which combines inductive methods with the power of first-order representations?
   a. Inductive programming   b. Logic programming
   c. Inductive logic programming   d. Lisp programming

8. Which is the first AI programming language?
   a. BASIC   **b.** FORTRAN
   c. IPL   **d.** LISP

9. What is the extraction of the meaning of utterance?
   a. Syntactic
   b. Semantic
   c. Pragmatic
   d. None of the mentioned

10. Artificial Intelligence is about_____.
   a. Playing a game on computer
   b. Making a machine Intelligent
   c. Programming on Machine with your own Intelligence
   d. Putting your intelligence in Machine

11. What is the condition of variables in first-order literals?
   a. Existentially quantified
   b. Universally quantified
   c. Both Existentially & Universally quantified
   d. None of the mentioned

12. The statement comprising the limitations of FOL is/are _____
   a. Expressiveness
   b. Formalizing Natural Languages
   c. Many-sorted Logic
   d. All of the mentioned

13. What is the process of associating a FOL expression with a phrase?
   a. Interpretation
   b. Augmented reality
   c. Semantic interpretation
   d. Augmented interpretation

14. The action of the Simple reflex agent completely depends upon _____
   a. Perception history
   b. Current perception
   c. Learning theory
   d. Utility functions

15. Which is not a property of representation of knowledge?
   a. Representational Verification
   b. Representational Adequacy
   c. Inferential Adequacy
   d. Inferential Efficiency

16. Which is an appropriate language for describing the relationships?
   a. First-order logic
   b. Propositional logic
   c. ILP
   d. None of the mentioned

17. Which is the most straightforward approach for planning algorithm?
   a. Best-first search
   b. State-space search
   c. Depth-first search
   d. Hill-climbing search

18. Which of the following is an advantage of using an expert system development tool?
   a. imposed structure
   b. knowledge engineering assistance
   c. rapid prototyping
   d. all of the mentioned

19. What are the main components of the expert systems?
   a. Inference Engine
   b. Knowledge Base
   c. Inference Engine & Knowledge Base
   d. None of the mentioned

20. _____ trees can be used to infer in Horn clause systems.
   a. Min/Max Tree
   b. And/Or Trees
   c. Minimum Spanning Trees
   d. Binary Search Trees

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(**PART-B : Descriptive**)

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

1. Explain the main aims, goals and uses of Artificial Intelligence.   **10**

2. Suppose we put into a logical database a segment the US census   **10**
    data listing in city of residence, date of birth and mother of every
    person, using social security number identifying constants for each
    person. Thus, George's age is given by Age(443-65-1263). Which of
    the indexing schemesS1-S5 following enable an efficient solution for
    which queries Q1-Q4 (assuming normal backward chaining)?
    S1: an index for each atom in each position.
    S2: an index for each first argument
    S3: an index for each predicate atom
    S4: an index for each combination of predicate and first argument
    S5: an index for each combination of predicate and second
    argument and an index for each first argument.
    Q1: Age(443-44-4321,x)
    Q2: ResidesIn(x, Houston)
    Q3: Mother(x, y)
    Q4: Age(x, 34)^(ResidesIn(x, TinyTownUSA)

3. Explain Heuristic Search Method in AI. How can solve problem   **4+6=10**
    using heuristic method explain with atleast two examples.

4. **a.** Write about alpha-beta pruning with its steps.   **5+5=10**

    b. Find the value of α and β for following tree structure.
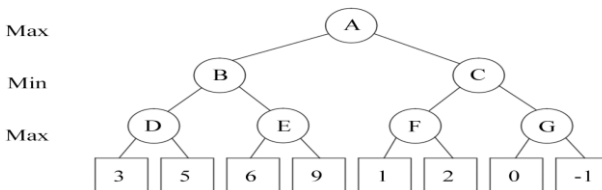
5. **a.** Describe production system with its component.   **4+6=10**

    b. Define predicate logic. Explain FOL with appropriate five
    examples.

6. Define Expert System with its categories. Explain forward and backward reasoning with examples.
Explain the deduction theorem? How we implement deduction theorem in case of propositional logic?

5+5=10

7. **a.** Define artificial neural network. Write the difference between artificial neural network and deep neural network.

6+4=10

   b. Write the basic rules and semantics of LISP

8. An alternative scheme for representing measuring involves applying the units function to an abstract length object. In such a scheme, one word write Inches(Length(L1))=1.5. how does this scheme compare with the other one? Issue include conversion axioms, names for abstract quantities(such as $50), and comparisons of abstract measures in different units(50 inches>50 centimeter)

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