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Subject Code:- AMCA0401

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**NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA**

**(An Autonomous Institute Affiliated to AKTU, Lucknow)**

**MCA**

**SEM: IV - THEORY EXAMINATION (2022-2023)**

**Subject: Artificial Intelligence**

**Time: 3 Hours**

**Max. Marks: 100**

**General Instructions:**

**IMP:** Verify that you have received the question paper with the correct course, code, branch etc.

1. This Question paper comprises of **three Sections -A, B, & C.** It consists of Multiple Choice Questions (MCQ's) & Subjective type questions.

2. Maximum marks for each question are indicated on right -hand side of each question.

3. Illustrate your answers with neat sketches wherever necessary.

4. Assume suitable data if necessary.

5. Preferably, write the answers in sequential order.

6. No sheet should be left blank. Any written material after a blank sheet will not be evaluated/checked.

**SECTION A**

**20**

**1. Attempt all parts:-**

- 1-a. The conference that launched the AI revolution in 1956 was held at? (CO1) 1
- (a) Dartmouth
  - (b) Harvard
  - (c) New York
  - (d) Stanford
- 1-b. A major thrust of AI is in the development of computer functions associated with human intelligence. (CO1) 1
- (a) TRUE
  - (b) FALSE
  - (c) AI is not associated with human intelligence
  - (d) None of the above
- 1-c. BFS stand for. (CO2) 1
- (a) Behind-first search
  - (b) Breadth-first search

- (c) Back-first search
- (d) None of the mentioned
- 1-d. The initial state and the legal moves for each side define the \_\_\_\_\_ for the game. (CO2) 1
- (a) Search Tree
- (b) Game Tree
- (c) State Space Search
- (d) Forest
- 1-e. Which of the following strategies are used by Inference Engine? (CO3) 1
- (a) Forward Chaining
- (b) Block Chaining
- (c) Stable Chaining
- (d) Both A and B
- 1-f. Translate the following statement into FOL. "For every a, if a is a philosopher, then a is a scholar" (CO3) 1
- (a)  $\forall a \text{ philosopher}(a) \text{ scholar}(a)$
- (b)  $\exists a \text{ philosopher}(a) \text{ scholar}(a)$
- (c) All of the mentioned
- (d) None of the mentioned
- 1-g. Identify the difficulties with the k-nearest neighbor algorithm. (CO4) 1
- (a) Curse of dimensionality
- (b) Calculate the distance of the test case from all training cases
- (c) Both
- (d) None of the above
- 1-h. The effectiveness of an SVM depends upon \_\_\_\_\_ (CO4) 1
- (a) kernel parameters
- (b) selection of kernel
- (c) soft margin parameter
- (d) All of the above
- 1-i. Which of the following is disadvantages pattern recognition? (CO5) 1
- (a) Syntactic Pattern recognition approach is complex to implement
- (b) It is very slow process
- (c) Sometime to get better accuracy, larger dataset is required

(d) All of the above

- 1-j. Parts-of-Speech tagging determines \_\_\_\_\_ (CO5) 1
- (a) part-of-speech for each word dynamically as per meaning of the sentence
- (b) part-of-speech for each word dynamically as per sentence structure
- (c) all part-of-speech for a specific word given as input
- (d) All of the above

**2. Attempt all parts:-**

- 2.a. Discuss maturation of Artificial Intelligence from year 1943 to year 1952? (CO1) 2
- 2.b. What is a heuristic function? (CO2) 2
- 2.c. Explain various types of Uncertainty in Artificial Intelligence? (CO3) 2
- 2.d. What are various algorithms used in supervised learning. (CO4) 2
- 2.e. Write a short note on pattern recognition. (CO5) 2

**SECTION B**

**30**

**3. Answer any five of the following:-**

- 3-a. What are the different types of Artificial Intelligence? Explain how can AI be used in detecting fraud. (CO1) 6
- 3-b. Explain the different domains of Artificial Intelligence. Also, write some misconception of AI. (CO1) 6
- 3-c. Explain the different steps to design a well- defined Learning System in detail. (CO2) 6
- 3-d. What do you mean by well-defined Learning System? Explain the steps to design a well- defined Learning System. (CO2) 6
- 3.e. What are the elements of propositional logic? (CO3) 6
- 3.f. What are Major Paradigms of Machine Learning? (CO4) 6
- 3.g. Describe various components of pattern recognition. (CO5) 6

**SECTION C**

**50**

**4. Answer any one of the following:-**

- 4-a. Explain History of Artificial Intelligence in detail. (CO1) 10
- 4-b. Discuss how AI has its impact on healthcare and transportation field. Justify your answer. (CO1) 10

**5. Answer any one of the following:-**

- 5-a. Explain the working of Minimax Algorithm with example. Also, write its properties. (CO2) 10

5-b. Explain Local search algorithm. (CO2) 10

**6. Answer any one of the following:-**

6-a. Consider the following axioms in clause form and prove that " Marcus hates Caesar" using Resolution. (CO3) 10

1. man(Marcus)

2. Pompeian(Marcus)

3.  $\sim$ Pompeian(x1)  $\vee$  Roman(x1)

4. ruler(Caesar)

5.  $\sim$ Roman(x2)  $\vee$  loyalto(x2, Caesar)  $\vee$  hate(x2,Caesar)

6. loyalto(x3,f/(x3))

7.  $\sim$ man(x4) $\vee$  $\sim$ ruler(y1) $\vee$  $\sim$ tryassassinate(x4,y1)  $\vee$  loyalto(x4,y1)

8. tryassassinatel (Marcus, Caesar)

6-b. Explain knowledge representation along with types of knowledge. (CO3) 10

**7. Answer any one of the following:-**

7-a. Explain K-Means Clustering Algorithm along with its working. (CO4) 10

7-b. Explain various types of machine learning techniques along with comparison between them. (CO4) 10

**8. Answer any one of the following:-**

8-a. Discuss Applications of computer vision in detail. (CO5) 10

8-b. Explain the design cycle of a pattern recognition system. (CO5) 10