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# INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)

Dundigal, Hyderabad - 500 043

**B TECH V SEMESTER CIE-II EXAMINATIONS, FEBRUARY- 2024**

**Regulation: UG20**

**ARTIFICIAL INTELLIGENCE AND EXPERT SYSTEMS**

**Time: 2 Hours**

**CSE (AI & ML)**

**Max Marks: 20**

**Answer any FOUR questions**

**All parts of the question must be answered in one place only**

1. (a) Describe how A\* algorithm is the simplification of best-first search algorithm?  
[BL: Understand| CO: 4|Marks: 2]
- (b) Identify the need for utility theory in uncertainty. Summarize alpha beta pruning in game theory.  
[BL: Apply | CO: 4|Marks: 3]
2. (a) How can the knowledge base be updated properly when a new fact is added to the system?  
[BL: Understand| CO: 5|Marks: 2]
- (b) Show how a JTMS could be used in medical diagnosis. Consider the rules such as, "If you have a runny nose, assume you have a cold unless it is allergy season."? [BL: Apply | CO: 5|Marks: 3]
3. (a) Summarize Dempster-Shafer theory. Distinguish between chronological backtracking and dependency directed backtracking.  
[BL: Understand| CO: 5|Marks: 2]
- (b) Use one or more nonmonotonic reasoning systems that can answer the following questions:
  - i) Does Tweety fly?
  - ii) Does Chirpy fly?
  - iii) Does Feathers fly?
  - iv) Does Paul fly?
 [BL: Apply | CO: 5|Marks: 3]
4. (a) Illustrate following expert system architectures:
  - i) Rule-based system architecture
  - ii) Associative or semantic network architecture
  - iii) Network architecture
  - iv) Blackboard system architectures
 [BL: Understand| CO: 6|Marks: 2]
- (b) Rule-based systems often contain rules with several conditions in their left sides: Why it this true in MYCIN? Why is this true in RI?  
[BL: Apply | CO: 2|Marks: 3]
5. (a) Illustrate the schematic diagram of an expert system and explain all the relevant components in it.  
[BL: Understand| CO: 6|Marks: 2]
- (b) Implement the candidate elimination algorithm for version spaces. Choose a concept space with several features like space of books, computers, animals etc.,. Pick the concept and demonstrate learning by presenting positive and negative examples of the concept.  
[BL: Apply | CO: 6|Marks: 3]