| CODE: GR18A3050 | GR 18 | SET - 2 |
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# III B.Tech I Semester Supplementary Examinations, December/January 2022/23

## ARTIFICIAL INTELLIGENCE

**(Common to CSE & IT)**

**Time: 3 hours** **Max Marks: 70**

**Instructions:**

1. Question paper comprises of **Part-A** and **Part-B**
2. **Part-A** (for 20 marks) must be answered at one place in the answer book.
3. **Part-B** (for 50 marks) consists of **five questions with internal choice,** answer all questions.

**PART – A**

**(Answer ALL questions. All questions carry equal marks)**

**10 * 2 = 20 Marks**

| | | | |
|---|---|---|---|
| **1. a.** | What is an expert system? | **[2]** |
| **b.** | Need of formulating the problems in AI. | **[2]** |
| **c.** | Express 'A car without wheels is not valuable' in predicate logic. | **[2]** |
| **d.** | Show the connection between sentences and facts provided by the semantics of the language. | **[2]** |
| **e.** | Define belief network. | **[2]** |
| **f.** | Define prior or unconditional probability and posterior or conditional probability. | **[2]** |
| **g.** | What is the significance of utility functions in decision making? | **[2]** |
| **h.** | List two key assumptions in a hidden Markov model. | **[2]** |
| **i.** | What are the two important drawbacks of the straightforward approach? | **[2]** |
| **j.** | What are the major issues which affect the design of learning system? | **[2]** |

**PART – B**

**(Answer ALL questions. All questions carry equal marks)**

**5 * 10 = 50 Marks**

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|---|---|---|---|
| **2.** | **(a)** Write an algorithm for calculating minimax decisions. What is the role of alliances in multiplayer games? | **[10]** |
| | **(b)** Write the alpha-beta search algorithm. What is the role of transposition table in this algorithm? | |
| | **OR** | |
| **3.** | **(a)** Explain the concept of utility-based agent with an example. | **[10]** |
| | **(b)** Provide a state space for the game of chess. | |
| **4.** | **(a)** Distinguish between predicate and propositional logic with suitable example. | **[10]** |
| | **(b)** Distinguish between forward and backward chaining. | |
| | **OR** | |
| **5.** | **(a)** Determine whether the following is Satisfiable, Contradictory or Valid : | **[10]** |
| | **(b)** How AI handles reasoning under uncertainty? Explain with example. | |
| **6.** | **(a)** Discuss about Bayesian Theory and Bayesian Networks. | **[10]** |
| | **(b)** Explain a typical belief network with conditional probabilities. | |

**OR**

| | | |
|---|---|---|
| **7.** | **(a)** What is the Bayes rule used for give illustrative examples? | **[10]** |
| | **(b)** Compare the conventional programs and rule based systems. | |
| **8.** | **(a)** Explain Hidden Markov Model with a standard mathematical example. | **[10]** |
| | **(b)** Explain the process of inductive learning using decision trees. | |

**OR**

| | | |
|---|---|---|
| **9.** | **(a)** Discuss inference in temporal models in artificial intelligence. | **[10]** |
| | **(b)** Describe any four learning techniques with suitable examples. | |
| **10.** | **(a)** Explain geometry of image formation in the pinhole camera. | **[10]** |
| | **(b)** Explain the basic idea of cell decomposition in motion planning. | |

**OR**

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|---|---|---|
| **11.** | **(a)** What is edge detection? Briefly describe the edge detection process. | **[10]** |
| | **(b)** Explain five main components of a robot. | |

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