

**GUJARAT TECHNOLOGICAL UNIVERSITY****BE- SEMESTER-VII (NEW) EXAMINATION – WINTER 2024****Subject Code:3170716****Date:07-12-2024****Subject Name: Artificial Intelligence****Time:10:30 AM TO 01:00 PM****Total Marks:70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Simple and non-programmable scientific calculators are allowed.

- Q.1** (a) Define AI. What are the task domains of AI? **03**  
 (b) What is a “control strategy” and what are its characteristics? **04**  
 (c) Explain Problem characteristics. **07**

- Q.2** (a) Discuss Cut and Fail in Prolog. **03**  
 (b) Explain production system characteristics. **04**  
 (c) State Monkey and Banana problem. Give its state space representation. **07**

**OR**

- (c) State 3 missionaries and 3 cannibals’ problem. Give its state space representation. **07**

- Q.3** (a) Briefly discuss Declarative and procedural knowledge. **03**  
 (b) Represent the following sentences in first-order logic **04**  
 1. Some students took English subject.  
 2. Every student who takes English passes it.  
 3. Every person who buyes policy is a smart.  
 4. No person buyes an expensive policy.  
 (c) Write A\* algorithm **07**

**OR**

- Q.3** (a) Explain Nonmonotonic Reasoning. **03**  
 (b) Explain Min-Max search procedure. **04**  
 (c) Explain problem reduction using AND-OR graph. **07**

- Q.4** (a) Explain Components of a Planning System. **03**  
 (b) Explain Hopfield Network. **04**  
 (c) Explain different approaches to knowledge representation. **07**

**OR**

- Q.4** (a) Discuss Bay’s theorem. **03**  
 (b) Explain Perceptron. **04**  
 (c) Define Frames. Draw Semantic Net for following statements. a) Every kid likes candy. b) Every school going kid likes candy. **07**

- Q.5** (a) Explain Fuzzy Logic. **03**  
 (b) Explain Significance of the Genetic Operators. **04**  
 (c) Write Prolog programs to perform the following with LIST: i) Delete an element from a list ii) Concatenating of two lists **07**

**OR**

- Q.5** (a) Discuss the concept of “Heuristic” with an example. **03**  
 (b) Explain knowledge acquisition in expert system. **04**  
 (c) Define Natural language processing and explain Discourse and Pragmatic processing. **07**

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