

Total No. of Questions : 5]

SEAT No. :

PC-1728

[Total No. of Pages : 2

**[6353] - 45**

**T.E. (Computer Engineering)  
ARTIFICIAL INTELLIGENCE  
(2019 Pattern) (Semester - II) (310253)**

*Time : 2½ Hours]*

*[Max. Marks : 70*

*Instructions to the candidates:*

- 1) Answer Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6, Q.7 or Q.8.
- 2) Neat diagram must be drawn whenever necessary
- 3) Assume suitable data, if necessary

- Q1)** a) Define Game Theory. What are the components, defining game as a Search Problem? Draw a Game Tree for tic-tac-toe. [9]
- b) What do you understand by Constraint Propagation? Write short notes on Node Consistency and Arc Consistency. [8]

**OR**

- Q2)** a) Explain how Minimax and alpha-beta algorithms change for two-players, non zero-sum games in which each player has his or her own utility function. [9]
- b) Define Constraint Satisfaction Problem. Explain Map Coloring Example Problem. . Formulate the Map Coloring Problem as CSP. [8]
- Q3)** a) Define Knowledge base and Sentence. Describe in detail about Wumpus World Environment along with brief description to find out the agent. Explain Task Environment. [8]
- b) Represent the followings into First Order Logic form: [10]
- i) All employees earning Rs.45000 or more pay tax.
  - ii) Sita is a marine engineer and she is also an artist.
  - iii) Children love icecream.
  - iv) If Humidity is high, temperature is high then a person cannot feel comfortable.
  - v) Puppies are cute.

If AB and AC are equal, then angle B and C are equal.

ABC is an equilateral triangle.

Represent these facts in predicate logic.

**P.T.O.**

**OR**

- Q4)** a) Write Short notes on followings: [9]
- i) Syntax and Semantics
  - ii) Proposition Logic Vs First Order Logic
  - iii) Knowledge Engineering Process in First Order Logic
- b) Show the following Sentences are valid or not. [9]
- a)  $(P \wedge Q) \rightarrow (P \vee Q)$    b)  $(\neg A \vee B) \wedge (\neg B \vee C) \rightarrow (\neg A \vee C)$
- Q5)** a) Prove that Universal Instantiation is sound and that Existential Instantiation produces an inferentially equivalent knowledge base. [8]
- b) Write Short notes on : [9]
- i) Forward Chaining
  - ii) Categories and Objects
  - iii) Back ward Chaining

**OR**

- Q6)** a) What do you understand by Resolution? Describe the Procedure to convert into CNF? Find the clause of the expression:  $(\neg P \vee Q) \rightarrow R$  [9]
- b) What are the reasoning systems for Categories? Explain Semantic Network and Description Logic . [8]
- Q7)** a) Describe the differences and similarities between problem solving and planning. [5]
- b) Explain AI components and AI architecture [5]
- c) What are the different types of planning? How planning algorithm can be represented as state space search? [8]

**OR**

- Q8)** a) Explain What are Planning approaches? [6]
- b) Explain The Blocks World in detail. [6]
- c) What are the limitations of AI? Explain What are the Future Scopes with AI? [6]

