

Total No. of Questions : 8]

SEAT No. :

**P277**

[Total No. of Pages : 2

**[6003]-356**

**T.E. (Computer Engineering)  
ARTIFICIAL INTELLIGENCE**

**(2019 Pattern) (Semester - II) (310253)**

*Time : 2½ Hours]*

*[Max. Marks : 70*

*Instructions to the candidates:*

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

- Q1)** a) List All problem solving strategies. What is backtracking, explain with n queen problem, with Branch and bound or Backtracking. [8]
- b) Explain Monte Carlo Tree Search with all steps and Demonstrate with one Example. [9]

OR

- Q2)** a) i) Explain limitations of game search algorithm, Differentiate between stochastic and partial games AND. [9]
- ii) Explain How use of alpha and beta cut-offs will improve performance of mini max algorithm? [9]
- b) Define is Constraint satisfaction problem, State the types of consistencies Solve the following Crypt Arithmetic Problem. [8]
- SEND  
+MORE  
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MONEY

- Q3)** a) What is an Agent. Name any 5 agents around you Explain Knowledge based agent with Wumpus World. [9]
- List and explain in short the various steps of knowledge engineering process.
- b) Consider the following axioms: [9]
- If a triangle is isosceles, then its two sides AB and AC are equal,  
If AB and AC are equal, then angle B and C are equal  
ABC is an equilateral triangle,  
Represent these facts in predicate logic.  
Explain Inference in Propositional Logic.

OR

**P.T.O.**

**Q4) a)** Write the following sentences in FOL (any 2) (using types of quantifiers). [9]

- i) Every number is either negative or has a square root .
- ii) Every connected and circuit-free graph is a tree .
- iii) Some people are either religious or pious
- iv) There is a barber who shaves all men in the town who do not shave themselves.

b) What is Resolution? Solve the following statement by using resolution algorithm. Draw suitable resolution graph. [9]

- i) Rajesh like all kind of food.
- ii) Apple and vegetables are food.
- iii) Anything anyone eats and is not killed is food.
- iv) Ajay eats peanuts and still alive.

Prove that Rajesh like bananas. .

**Q5) a)** Explain Forward Chaining and Backward Chaining. With its Properties, with one. example. [9]

b) Explain Unification Algorithm in FOL. Solve stepwise with proper comments if  $p(x, g(x))$  is equal to or not equal to  $f(\text{prime}, f(\text{prime}))$  [8]

OR

**Q6) a)** Explain FOL inference for following Quantifiers. [8]

- i) Universal Generalization.
- ii) Universal Instantiation.
- iii) Existential Instantiation.
- iv) Existential introduction

b) What is Ontological Engineering ,in details with its categories object and Model. [9]

**Q7) a)** Explain with an example State Space Planning. [5]

b) Explain with example, how planning is different from problem solving. [5]

c) Explain AI components and AI architecture. [8]

OR

**Q8) a)** Explain Planning in non deterministic domain. [5]

b) Explain. [8]

- i) Importance of planning
- ii) Algorithm for classical planning

c) Explain Limits of AI and Future opportunities with AI. [5]

