Total No. of Questions : 8]

SEAT No. :

**P814**

[Total No. of Pages : 2

# [5870] - 1135
## 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 diagrams must be drawn whenever necessary.***
3) ***Assume suitable data if necessary.***

***Q1)*** a) Explain Alpha - Beta Tree search and cutoff procedure in deatil with example. **[9]**

b) What are the issues that need to be addressed for solving esp efficiently? Explain the solutions to them. **[9]**

OR

***Q2)*** a) Explain in detail the concepts of back tracking and constraint propagation and solve the N-queen problem using these algorithms. **[9]**

b) Write a short note on Monte Carlo Tree search and list its limitations. **[5]**

c) Apply constraint satisfaction method to solve following Problem

SEND + MORE = MONEY. (TWO + TWO = FOUR, CROSS+ ROADS= DANGER) **[4]**

***Q3)*** a) List the inference rules used in prepositional logic? Explain them in detail with suitable example. **[9]**

b) Explain syntax and semantics of First Order Logic in detail. **[8]**

OR

***Q4)*** a) Detail the algorithm for deciding entailment in prepositional logic. **[8]**

b) Explain knowledge representation structure and compare them. **[9]**

***P.T.O.***

***Q5)*** a) Explain Forward and Backward chaining. What factors justify whether reasoning is tobe done in forward or backward chaining. **[9]**

b) What are the reasoning patterns in propositional logic? Explain them in detail. **[9]**

OR

***Q6)*** a) Explain unification algorithm with an example. **[8]**

b) Explain knowledge representation structures and compare them. **[7]**

c) What do you mean by Ontology of situation calculus? **[3]**

***Q7)*** a) Analyse various planning approaches in detail. **[9]**

b) Discuss AI and its ethical concerns. Explain limitations of AI. **[8]**

OR

***Q8)*** a) Explain the terms for time and schedule from perspective of temporal planning. **[9]**

b) Write a detailed note on AI Architecture. **[8]**

Total No. of Questions : 8]

SEAT No. :

**PA-1451**

[Total No. of Pages : 2

# [5926]-67

## 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 wherever necessary.***
3) ***Assume suitable data, if necessary.***

***Q1)*** a) Explain Min Max and Alpha Beta pruning algorithm for adversarial search with example. **[9]**

b) Define and explain Constraints satisfaction problem. **[9]**

OR

***Q2)*** a) Explain with example graph coloring problem. **[9]**

b) How AI technique is used to solve tic-tac-toe problem. **[9]**

***Q3)*** a) Explain Wumpus world environment giving its PEAS description. **[9]**

b) Explain different inference rules in FOL with suitable example. **[8]**

OR

***Q4)*** a) Write an propositional logic for the statement, **[10]**

i) "All birds fly"

ii) "Every man respect his parents"

b) Differentiate between propositional logic and First order logic. **[7]**

***P.T.O.***

***Q5)*** a) Explain Forward chaining algorithm with the help of example. **[9]**

b) Write and explain the steps of knowledge engineering process. **[9]**

OR

***Q6)*** a) Explain Backward chaining algorithm with the help of example **[9]**

b) Write a short note on : **[9]**

i) Resolution and

ii) Unification

***Q7)*** a) Write a short note on planning agent, state goal and action representation. **[6]**

b) Explain different components of planning system. **[6]**

c) Explain the components of AI. **[5]**

OR

***Q8)*** a) What are the types of planning? Explain in detail. **[6]**

b) Explain Classical Planning and its advantages with example. **[6]**

c) Write note on hierarchical task network planning. **[5]**

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Total No. of Questions : 8]

SEAT No. :

**P277**

[Total No. of Pages : 2

# [6003]-356
# T.E. (Computer Engineering)
# ARTIFICAL 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 whenver 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 ofalpha and beta cut-offs will improve performance of mini-max algorithm?

b) Define is Constraint satisfaction problem, State the types ofconsistencies Solve the following Crypt Arithmetic Problem. **[8]**

SEND
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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 (prime, f(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]**

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**Total No. of Questions : 8]**

**SEAT No. :** 

**P-7547**

**[Total No. of Pages : 3**

# [6180]-55

## T.E. (Computer Engineering)

## ARTIFICIAL INTELLIGENCE

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

***Time : 2½ Hours]*** ***[Max. Marks : 70***

***Instructions to the candidates :***

1) ***Answer four questions 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 wherever necessary.***
3) ***Assume suitable data if necessary.***

***Q1)*** a) List All problem solving strategies. What is backtracking, explain with n queen problem. **[8]**

b) Write Minimax Search Algorithm for two players. How use of alpha and beta cut-offs will improve performance? **[9]**

OR

***Q2)*** a) Define Game theory, Differentiate between stochastic and partial games with examples. **[9]**

b) Define is Constraint satisfaction problem, State the types of consistencies Solve the followiig Crypt Arithmetic Problem. **[8]**

```
   B  A  S  E
+  B  A  L  L
-------------
   G  A  M  E  S
```

***Q3)*** a) What is an Agent. Name any 5 agents around you Explain Knowledge based agent with Wumpus World. List and explain in short the various steps of knowledge engineering process **[9]**

Consider the following axioms:If a triangle is equilateral then it is isosceles.

b) 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. **[9]**

OR

***P.T.O.***

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

i) All birds fly

ii) Some boys play cricket

iii) A first cousin is a child of a parent's sibling

iv) You can fool all the people some of the time and some of the people all the time

b) What is Knowledge Representation using propositional Logic? Compare propositional and predicate Logic. **[9]**

***Q5)*** a) Explain Forward Chaining and Backward Chaining. With its Properties, advantages and Disadvantages. **[9]**

Explain :

b) i) Unification in FOL **[8]**

ii) Reasoning with Default information

OR

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

- Universal Generalization
- Universal Instantiation
- Existential Instantiation
- Existential introduction

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

***Q7)*** a) Explain with an example Goal Stack Planning (STRIPS algorithm). **[5]**

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

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

OR

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

b) Explain **[5]**

i) Importance of planning.

ii) Algorithm for classical planning .

c) What is AI Explain. Scope of AI in all walks of Life also explain Future opportunities with AI. **[8]**

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