

III B.Tech. II Semester Regular Examinations, April/May -2005
ARTIFICIAL INTELLIGENCE
(Electronics & Computer Engineering)

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. (a) Discuss the areas of application of Artificial Intelligence.
(b) Discuss the **tic-tac-toe** problem in detail and explain how it can be solved using AI techniques.
2. (a) Explain with example AND / OR graphs.
(b) Write down the algorithm for generate and test search.
3. (a) What are tautologies contradictions and contingencies.
(b) Consider the following facts:
Jack likes all kinds of pets.
Dogs are pets.
Cats are pets.
Any animal any one owns and is not killed is a pet.
Mary owns a goat and is still alive
Joe owns everything Mary owns.
 - i. Translate the facts into formulae in Predicate logic
 - ii. Convert ht formulae into clausal form
 - iii. Prove that Jack likes goats using Resolution
4. (a) Discuss in detail with proper illustrations the Semantic nets and Scripts. What are its advantages and limitations?
(b) Explain the major components of a Restaurant Scripts.
5. (a) Consider the problem of finding clothes to wear in the morning. The knowl-edges are
-Wear jeans unless either they are dirty or you have a job interview today.
-Wear a sweater if it's cold
-Its usually cold in the winter
-Wear sandals if it's warm
-Its usually warm in the summer
 - i. Build a JTMS-style database of the necessary facts to solve this problem.
 - ii. Show how the problem can be solved and how the solution changes as the relevant facts change.
(b) TMSs are useful tools in solving constraint satisfaction problems. Give your opinion.
6. (a) What is hierarchical planning?

- (b) Explain with relevant examples.
- (c) What is constraint satisfaction?
- 7. (a) What is natural language processing?
- (b) Write Production rules necessary to check the syntax of an English noun. The Grammar shall include both proper and common nouns?
- 8. Discuss in a comparative manner (in detail) the important characteristics of
 - (a) Deterministic Decision function approach
 - (b) probabilistic Decision function approach in pattern Recognition problems. Give examples where each approach is more appropriate.

★ ★ ★ ★ ★

III B.Tech. II Semester Regular Examinations, April/May -2005**ARTIFICIAL INTELLIGENCE****(Electronics & Computer Engineering)****Time: 3 hours****Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

1. (a) Show that the **Tower of Hanoi** problem can be classified under the area of AI. Give a state space representation of the problem.
(b) What are the characteristics of a production system?
2. Trace the constraint satisfaction procedure solving the crypt arithmetic problem.
SEND
+MORE

MONEY
3. (a) Explain how the Herbrand's theorem forms the basis of resolution.
(b) What are the shortcomings of the resolution process? Explain with examples.
(c) Assume the following facts
Steve only likes easy courses
Science courses are hard
All courses in fine arts department are easy.
FA 101 is a fine arts course.
Use resolution to answer the question "Name a course that Steve likes"
4. (a) What is meant by conceptual dependency? Explain its uses.
(b) Explain the primitive conceptual dependency forms.
5. (a) What is CWA? What are the merits of CWA? Explain with example, the disadvantages of CWA.
(b) Describe the differences between the JTMS and LTMS.
(c) Write short note on circumscription.
6. (a) Under what circumstances, would it be a good idea to use search graph than a tree search in Minimax procedure?
(b) How would the minimax procedure be modified for a program playing a three person game than a two person game?
7. (a) What is natural language processing?
(b) Write Production rules necessary to check the syntax of an English noun. The Grammar shall include both proper and common nouns?

8. (a) Define and Explain “Learning” . Describe in detail, the range of activities covered by the concept “Learning”. Justify the statement -that “Learning is the most important characteristic of Intelligence”.
- (b) Describe and discuss in detail, the important aspects of
- i. Rote Learning
 - ii. Learning by taking advice. Illustrate answer with the help of relevant examples.

★ ★ ★ ★ ★

III B.Tech. II Semester Regular Examinations, April/May -2005
ARTIFICIAL INTELLIGENCE
(Electronics & Computer Engineering)

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. (a) Show that the **Tower of Hanoi** problem can be classified under the area of AI. Give a state space representation of the problem.
(b) What are the characteristics of a production system?
2. (a) Explain with example AND / OR graphs.
(b) Write down the algorithm for generate and test search.
3. (a) What is the significance of Knowledge representation? Compare and contrast database and knowledge base.
(b) Discuss with examples Procedural versus Declarative representations. Which is advantageous? Give reasons.
4. (a) Explain how the various quantifiers are handled in semantic networks with examples.
(b) Suggest a semantic network to describe the furniture in a house. Include all the normally found items.
5. (a) What is CWA? What are the merits of CWA? Explain with example, the disadvantages of CWA.
(b) Describe the differences between the JTMS and LTMS.
(c) Write short note on circumscription.
6. (a) What is Alpha-Beta pruning?
(b) Implement the alpha-beta search procedure for playing tic-tac-toe.
7. (a) Show a parse tree for “India wins third N-Power test after losing second one”. Explain what knowledge is necessary to produce the correct parse.
(b) Show how the sentence “LAXMAN BATTED THROUGH THE INNINGS” would be represented in case grammar. Show how would it be represented in CD.
8. Define and explain the concept of “Learning” Describe the features of the following methods of Learning.
 - (a) Memorization (Rote learning)
 - (b) Direct Instruction (Taking advice)
 - (c) Analogy (By example)

(d) Induction

(e) Deduction.

★ ★ ★ ★ ★

III B.Tech. II Semester Regular Examinations, April/May -2005
ARTIFICIAL INTELLIGENCE
(Electronics & Computer Engineering)

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. (a) Write down the state space representation, production rules, and any two solutions for the water jug problem.
(b) Explain problem characteristics with examples.
2. (a) Explain with example AND / OR graphs.
(b) Write down the algorithm for generate and test search.
3. (a) What is resolution? How it is used in theorem proving?
(b) Explain the algorithm of converting well-formed-formulas to clause form.
4. (a) Explain how the various quantifiers are handled in semantic networks with examples.
(b) Suggest a semantic network to describe the furniture in a house. Include all the normally found items.
5. (a) List the key reasoning operations that are performed by JTMS.
(b) An example of nonmonotonic reasoning involves birds and flying. Consider the following facts:
 - Most things do not fly
 - Most birds do fly, unless they are too young or lean or have a broken wing
 - Penguin and ostriches do not fly
 - Magical ostriches fly
 - Tweety is a bird
 - Chirpy is either a penguin or an ostrich
 - Feathers is a magical ostrichUse one or more nonmonotonic reasoning systems answer the following:
 - i. Does Tweety fly?
 - ii. Does Chirpy fly?
 - iii. Does Feathers fly?
 - iv. Does Paul fly?
6. (a) Describe how Alpha-Beta search works with relevant examples.
(b) How does the minimax search helps in solving tic-tac-toe problem?
7. (a) What is a simple transition network (STN)?
(b) Differentiate between Augmented transition network and STN with relevant examples in BNF Constructs.

8. Describe and discuss in detail, the techniques of
- (a) Parameter adjustment
 - (b) Macro-operations
 - (c) chunking used in problem- solving method of “Learning”. Explain the nature of utility problem.
