

IV B.Tech. II Semester Regular Examinations, April/May -2005
ARTIFICIAL INTELLIGENCE & EXPERT SYSTEMS
(Electronics and Control Engineering)

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. (a) Explain the characteristics of production systems.
(b) Derive the production rules for the water Jug problem.
2. (a) What is a heuristic search technique? List and brief the various heuristic search techniques.
(b) Describe the best-first search algorithm with its areas of applications.
3. (a) Write A* algorithm and apply on 8-puzzle problem.
(b) Explain resolution algorithm with a suitable illustration.
4. (a) Write a brief notes on Bayesian networks.
(b) Write a brief notes on fuzzy logic. List the application areas of fuzzy logic technique.
5. (a) Write the merits and demerits of semantic nets and conceptual dependency techniques.
(b) Write a brief notes on "neural networks". What are the applications of neural networks.
6. (a) Describe the waltz algorithm for understanding.
(b) Describe the Explanation-based learning method.
7. (a) Describe the role of AI in medical diagnosis.
(b) Describe the important characteristics of AI languages.
8. (a) Write a program in PROLOG or LISP to implement depth-first-search technique.
(b) List the applications of AI and also the computer architecture required to implement AI application.

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1. (a) What is a production system? Describe the characteristics of production systems.
(b) Describe the problem characteristics.
2. (a) Compare and contrast the differences between problem tree and problem graph.
(b) Describe the Means-ends-analysis algorithm. Also list its areas of applications.
3. (a) Explain forward versus backward reasoning. In what kind of a problem would a forward reasoning be better than a backward reasoning.
(b) Represent the following facts in predicate logic
 - i. John only sees good movies
 - ii. People enjoy Creativity
 - iii. Some people make fun of everybody
 - iv. An object which is heavy cannot be moved by a weak person.
 - v. Every student will be happy when examinations are just over.
4. (a) What is non-monotonic reasoning? Describe the design issues to solve various problems using non-monotonic reasoning.
(b) Describe the theory behind statistical reasoning.
5. (a) With the help of a case situation, explain the knowledge representation methods using frames.
(b) Describe the issues involved in the natural language understanding process.
6. Explain the following concepts with necessary illustrations.
 - (a) Learning
 - (b) Perception
7. (a) Describe the important characteristics of AI languages.
(b) Describe the role of AI in medical diagnosis.
8. (a) What are the components of an AI program? List the applications of AI.
(b) Write a program in PROLOG or LISP to implement depth-first-search algorithm.

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1. (a) Describe problem characteristics in detail.
(b) Briefly present the issues involved in the design of search programs.
2. (a) Explain the hill climbing technique with suitable example situations.
(b) Describe the breadth-first-search algorithm with the help of suitable illustrations.
3. (a) Compare and contrast the differences between forward and backward reasoning.
(b) How to design a question answering system? Explain with necessary illustrations.
4. (a) Describe the concept of scripts with an example illustration.
(b) Describe the different ways of representing sentences into semantic nets.
5. (a) Write a brief notes on "fuzzy logic" with its areas of applications.
(b) Describe the steps and components involved in natural language understanding process.
6. (a) Describe the Winston's learning program.
(b) Describe the concepts of perception.
7. (a) Describe the role of AI in robotics.
(b) Explain the role of AI in satellite imaging.
8. (a) Write a PROLOG/LISP program to implement breadth-first-search algorithm.
(b) Write the important characteristics of AI languages.

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1. (a) Discuss the various issues in designing a search program.
(b) Explain how you would distinguish AI with natural intelligence. Hence explain the major characteristics of an AI problem.
2. (a) Compare and contrast the differences between breadth-first-search and depth-first-search techniques.
(b) What is heuristic search? Describe the A* algorithm with its areas of application.
3. (a) Describe the heuristic search procedure for AND/OR graphs .
(b) Explain the resolution algorithm in predicate logic.
4. (a) Describe the logics for non monotonic reasoning.
(b) Describe Dempster-shafer theory with necessary illustrations.
5. (a) Convert the following sentences into conceptual dependency form.
 - i. John ate ice cream with a spoon
 - ii. John ran yesterday
 - iii. I heard a frog in the woods.
(b) Describe the following in brief.
 - i. semantic analysis
 - ii. pragmatic analysis
6. (a) Describe the importance of understanding and explain what makes understanding hard?
(b) Describe the winstons learning program with necessary illustrations.
7. (a) Describe the role of AI in satellite imaging.
(b) Describe the features of LISP and PROLOG languages.
8. (a) Write a program in PROLOG or LISP illustrating the backtracking feature.
(b) Describe the components of AI program.
