

**IV B.Tech. II Semester Regular Examinations, April/May -2006**  
**ARTIFICIAL INTELLIGENCE AND EXPERT SYSTEMS**  
**(Electronics & Control Engineering)**

**Time: 3 hours**

**Max Marks: 80**

**Answer any FIVE Questions**  
**All Questions carry equal marks**

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1. (a) Clearly bring out the differences between Breadth first algorithm and depth first algorithm. [4]  
(b) What are the characteristics of production system. [8]  
(c) Explain about production system in solving an example AI problem. [4]
2. (a) Construct a script for a trip to park from the view point of a child. [6]  
(b) Explain with an example non-monotonic logic. [4]  
(c) What is default reasoning? What are the approaches to do default reasoning? [6]
3. (a) Describe the applications of AI in robotics. [8]  
(b) What is learning technique? Describe the explanation based learning technique. [8]
4. (a) What are different data structures in PROLOG? [8]  
(b) Explain the basic lisp functions with suitable examples. [8]
5. (a) Explain the basic characteristics of an expert systems. [8]  
(b) Discuss the branches and areas of application of Artificial Intelligence. [8]
6. (a) Differentiate between language understanding and language generation. [8]  
(b) Discuss the problems in developing a program which is capable of carrying on a dialog with a group of people. [8]
7. (a) Mention the limitations of Bayesian method of reasoning. [8]  
(b) Discuss the remedies for the limitations of Bayesian method of reasoning. [8]
8. Write short notes on: -  
(a) Staged search.  
(b) Resolution.  
(c) Fuzzy logic.  
(d) Conceptual dependency. [4×4=16]

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1. (a) Explain how you would distinguish AI with natural intelligence. Hence explain the major characteristics of an AI problem. [12]  
(b) Write an algorithm for simple Hill climbing. [4]
2. (a) Differentiate:  
Propositional logic vs predicate logic. [4]  
(b) Explain the concept of partitioned semantic net with an example. [6]  
(c) What are “Strong-slot-filler structures”? List and explain any one of the technique with suitable examples. [6]
3. (a) Describe the “Speech recognition” technique with its applications. [8]  
(b) What is bearing. Explain at least two learning techniques with an example. [8]
4. (a) Describe the important characteristics of AI languages. [8]  
(b) Describe the important components of an AI program. [8]
5. (a) Discuss in detail the role of knowledge in Expert systems. [8]  
(b) What are Expert system shells. Describe their role in building an Expert system. [8]
6. (a) Write a short notes on Bayesian network. [4]  
(b) Briefly explain about statistical reasoning and case grammars. [8]  
(c) Write Waltz algorithm for understanding constraint satisfaction. [4]
7. (a) What is MLP? [4]  
(b) Write production rules necessary to check the syntax of an English noun. The grammar shall include both proper and common nouns. [8]  
(c) Write a short notes on circumscription. [4]
8. Discuss the following:  
(a) CWA.  
(b) JTMS.  
(c) Frames.  
(d) Knowledge acquisition. [4×4=16]

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1. (a) Define a production system. [4]  
(b) List the seven problem characteristics and analyze the 8 puzzle problem with respect to each of them. [12]
2. (a) Define Resolution. Explain the Resolution algorithm with the help of an example. [6]  
(b) Write a short notes on “Statistical reasoning”. [4]  
(c) What is a frame? Discuss the properties, structure and usefulness of frames with the help of an example. [6]
3. (a) Explain ATN with an example. [8]  
(b) What is “Understanding”? Describe the understanding technique with its applications. [8]
4. (a) Describe the program structure of PROLOG and LISP. [8]  
(b) Explain GREEN cut and RED cut. [8]
5. (a) Differentiate between Expert system and conventional program. [8]  
(b) Explain the different ways of solving the problem. [8]
6. (a) What are the three general approaches to NLP? [8]  
(b) Describe the syntatic and sematic grammar. [8]
7. (a) Define certainty factor? What are components of certainty factor? [8]  
(b) Explain Bayesian method of reasoning? [8]
8. Write short notes on: -
  - (a) Script
  - (b) Best search
  - (c) Speech recognition
  - (d) Perception. [4×4=16]

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1. (a) Explain about simple Hill climbing and steepert Hill climbing algorithm. [8]  
(b) Define state space. Explain the same with an example. [4]  
(c) Differentiate between Forward and Backward reasoning. [4]
2. (a) Compare and constrast the differences between statistical and probabilistic reasoning. [8]  
(b) Write a brief notes on Fuzzy logic. [8]
3. (a) Describe the speech recognition technique with an example. [8]  
(b) Describe the Neural Networks technique with its applications. [8]
4. (a) Construct a script for a trip to a park. [8]  
(b) What is frame problem. [4]  
(c) Write short notes on conceptual dependency. [4]
5. (a) What is natural language process? Explain. [8]  
(b) Differentiate between language understanding and language generation. [8]
6. (a) Explain GREEN CUT and RED CUT. [8]  
(b) What are the different data structures in PROLOG? [8]
7. (a) Describe Waltz Algorithm. [8]  
(b) Briefly explain Winstons learning system. [8]
8. Write short notes on:-  
(a) Staged Search  
(b) Non-Montonoic reasoning  
(c) Expert systems  
(d) Speech recognition. [4×4=16]

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