

M.C.A. DEGREE EXAMINATION, DECEMBER 2008.

Third Year

Paper I — ARTIFICIAL INTELLIGENCE

Time : Three hours

Maximum : 75 marks

SECTION A — (3 × 15 = 45 marks)

Answer any THREE of the following.

1. What are problem characteristics? Explain how heuristic search technique is used to solve them.
2. Give an example of AND-OR graph and describe how AO^* algorithm works.
3. What is resolution? Explain how resolution works in propositional logic.
4. Define logic programming. Explain how a simple knowledge base can be represented in declarative and procedural ways.
5. What is an expert system? Discuss how a problem can be solved using domain knowledge.

SECTION B — (5 × 5 = 25 marks)

Answer any FIVE of the following.

6. What is an AI technique? How is it useful to solve a problem?
7. Write an algorithm for depth-first search.
8. Illustrate the steepest hill climbing algorithm.
9. Write an algorithm for means-ends analysis.
10. What are the ways of knowledge representation?
11. Explain the Frame problem.
12. Distinguish between forward and backward reasoning.
13. Explain common sense reasoning.

SECTION C — (5 × 1 = 5 marks)

Answer ALL of the following.

14. Define production system.
15. What is a constraint satisfaction problem?
16. What is knowledge representation?

17. Define non-monotonic reasoning.
18. What is knowledge acquisition?

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Paper II — CRYPTOGRAPHY AND NETWORK SECURITY

Time : Three hours

Maximum : 75 marks

SECTION A — (3 × 15 = 45 marks)

Answer any THREE of the following.

1. Describe the structure of simplified DES algorithm with a diagram.
2. Explain the overall structure for an International Data Encryption Algorithm.
3. Enumerate different methods of random number generation in network security.
4. Discuss the Diffie-Hellman key exchange algorithm.
5. Explain the algorithm for Digital Signature.

SECTION B — (5 × 5 = 25 marks)

Answer any FIVE of the following.

6. Write short notes on Hill Cipher encryption algorithm.
7. Explain the conventional encryption modes.
8. Discuss the characteristics of advanced symmetric block ciphers.
9. Explain the CAST-128 encryption algorithm.
10. Distinguish between link and end-to-end encryption.
11. How is the key management done in public key encryption?
12. Explain the role of Euler's theorem in public key encryption.
13. What are intruders? What are different types of intruders?

SECTION C — (5 × 1 = 5 marks)

Answer ALL of the following.

14. What is a block cipher?
15. Define cryptanalysis.
16. Define private key.
17. What is a firewall?
18. Define IP.

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Paper III — EMBEDDED SYSTEMS

Time : Three hours

Maximum : 75 marks

SECTION A — (3 × 15 = 45 marks)

Answer any THREE of the following.

1. What is processor technology? Explain various types of it and their benefits.
2. Describe the procedure of designing a general-purpose processor.
3. Explain in detail about various common memory types available.
4. Explain the merits and demerits of various transmission media.
5. Explain the following :
 - (a) Finite-state machines
 - (b) Concurrent process
 - (c) Real-time operating system.

SECTION B — (5 × 5 = 25 marks)

Answer any FIVE of the following.

6. Define an embedded system. What are its characteristics?
7. Write a short note on flip-flops.
8. Give an overview of LCD controllers.
9. Define pulse width modulator and explain its benefits.
10. Enumerate the advantages and disadvantages of using memory-mapped I/O.

11. Write short notes on arbitration.
12. Distinguish between text and graphics.
13. Distinguish between models and languages.

SECTION C — (5 × 1 = 5 marks)

Answer ALL of the following.

14. What is a design gap?
15. Define an interrupt.
16. What is CAN?
17. Define QNX.
18. Define data flow model.

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Paper IV — DATA MINING TECHNIQUES

Time : Three hours

Maximum : 75 marks

SECTION A — (3 × 15 = 45 marks)

Answer any THREE of the following.

1. Explain the components of data mining algorithms.
2. Discuss regression model structures for prediction.
3. Explain various scoring functions for predictive models.
4. Explain in detail the parametric density models.
5. Define SQL. How do you manipulate tables by it?

SECTION B — (5 × 5 = 25 marks)

Answer any FIVE of the following.

6. Explain Tree models.
7. Explain multi-dimensional indexing.
8. What are the various types of measurements in data analysis?
9. Explain the vector-space algorithm for text retrieval.
10. Explain the branch-and bound method of search.

11. Examine the EM algorithm.
12. Explain the algorithm for hierarchical clustering.
13. What are the scalable and non-scalable versions of data mining algorithms?

SECTION C — (5 × 1 = 5 marks)

Answer ALL of the following.

14. What is data fishing?
15. What is data squashing?
16. Define data mining.
17. What is near neighbor?
18. What are artificial neural networks?

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Paper V — SYSTEMS AUDITING

Time : Three hours

Maximum : 75 marks

SECTION A — (3 × 15 = 45 marks)

Answer any THREE of the following.

1. Examine the objectives of ISA with the help of an example of a software company?
2. Define threat? Explain various sources of threats to the assets of information system?
3. Discuss the stages of program development life cycle (PDLC).
4. Explain various white-box test-data design methods.
5. Examine the update protocols and report protocols with examples.

SECTION B — (5 × 5 = 25 marks)

Answer any FIVE of the following.

6. Bring out the effects of computers on auditing.
7. Explain end-to-end encryption of communication controls.
8. What are QA functions? List out.
9. What are the various types of coding systems?
10. Enumerate the benefits of code comparison?
11. Explain various flow controls.

12. Define Data Repository Systems. What are its functions?

13. Define audit software. What are their characteristics?

SECTION C — (5 × 1 = 5 marks)

Answer ALL of the following.

14. Define systems audit?

15. Define big-bang testing?

16. Define control matrices.

17. Define source code review?

18. What is security program?
