

M.Sc. Information Technology (Final) DEGREE EXAMINATION, DEC 2007

Paper-I: C++

Time: Three hours

Maximum: 75 Marks

SECTION-A (3 x 15 = 45 marks)

Answer any THREE of the following.

1. (a) Explain the Basic Concepts of OOP.
(b) Write a C++ program to find the sum of the digits of a given number.
2. (a) What is a qualifier? Explain various qualifiers used in C++.
(b) What are strings? Are they standard of derived data types? Write an interactive program to check whether a given string is a Palindrome or not? What happens if the end of string is missing?
3. Design three classes: Student, exam and results, where result is inherited from exam and exam is inherited from student. Write possible constructors to initialize the values. Write a main function to test the constructor execution by creating objects.
4. Explain the exception handling constructs in C++.
5. Explain the various control structures in C++ with syntax and examples.

SECTION-B (5 x 5 = 25 marks)

Answer any FIVE of the following.

6. Write a C++ program to check whether a given number is prime or not.
7. Write a C++ program to overload the '+' operator to add two complex numbers.
8. Explain friend function with an example.
9. What are manipulators? List out various predefined manipulators supported by C++ streams.
10. Create and demonstrate a Queue using class template.
11. Explain the concept of Polymorphism. Give an example for Function Overloading.
12. What is Inheritance? Explain different types of Inheritances.
13. What is function template? Write a function template to find a smallest element in an array.

SECTION-C (5 x 1 = 5 marks)

Answer ALL of the following.

14. (a) What is an iterator?
(b) Write Syntax to overload NEW operator.
(c) Define Pure Virtual Function.
(d) Static Binding Vs Dynamic Binding.
(e) List out the different types of Constructors.

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Paper-II : SOFTWARE ENGINEERING

Time: Three hours

Maximum: 75 Marks

SECTION-A (3 x 15 = 45 marks)

Answer any THREE of the following.

1. Explain in detail about the prototyping model and the spiral model.
2. Define system. What are the system elements? Explain about product engineering hierarchy.
3. What are the various design principles? Compare Cohesion and Coupling.
4. What is transaction mapping? Explain the design procedure of Transaction Mapping with an example.
5. What is white box testing? Explain the concept of cyclomatic complexity with an example.

SECTION-B (5 x 5 = 25 marks)

Answer any FIVE of the following.

6. What is a Myth? Explain about the three different types of Myths.
7. What is Requirement Analysis? Why is it so difficult to gain a clear understanding of what the customer wants? Explain.
8. What are the various analysis principles?
9. What is Modularity? How can we evaluate a design method to determine if it will lead to effective modularity?
10. Write short notes on Data flow diagrams with an example.
11. What is Integration Testing? Explain the various approaches in Integration Testing.
12. What is debugging? Explain the process of debugging. What are debugging approaches?
13. Define software quality. Explain Mc Calls quality factor.

SECTION-C (5 x1 = 5 marks)

Answer ALL of the following.

14. Define Metric.
15. What is Cardinality?
16. Differentiate abstraction and refinement.
17. What is Beta Testing?
18. What is Stress Testing?

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Paper- III: TCP / IP

Time: Three hours

Maximum: 75 Marks

SECTION-A (3 x 15 = 45 marks)

Answer any THREE questions.

1. Describe in detail about classful internet addresses.
2. Describe the Address Resolution problem. Explain.
3. Discuss in detail about Internet control message protocol.
4. Discuss in detail about UDP, with neat sketches.
5. Describe the implementation of TCP / IP over ATM networks.

SECTION-B (5 x 5 = 25 marks)

Answer any FIVE questions.

6. Discuss the properties of an Ethernet.
7. Explain the features of primary and backup RARP servers.
8. Draw the neat sketch of an Internet datagram.
9. Explain the concept of table driven IP routing.
10. Describe the features of proxy ARP.
11. Discuss the important boundaries in TCP / IP Model.
12. Explain the characteristics of Mobile IP.
13. Discuss the features of Dynamic Host Configuration protocol.

SECTION-C (5 x1 = 5 marks)

Answer ALL questions.

14. Define subnet mask.
15. What are the disadvantages of layering architecture.
16. Define Supernetting.
17. What does a router do with the time to live value in IP header?
18. What are the advantages of doing reassembly at the ultimate destination instead of doing it after the datagram travels across one network?

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Paper- IV: DATA MINING AND TECHNIQUES

Time: Three hours

Maximum: 75 Marks

SECTION-A (3 x 15 = 45 marks)

Answer any THREE of the following.

1. Explain the tools for displaying relationships between two variables and more than two variables.
2. Describe the Model structures for prediction.
3. Explain any three parameter optimization methods.
4. Describe the features of partition based clustering algorithms.
5. Describe about various generalized linear models.

SECTION-B (5 x 5 = 25 marks)

Answer any FIVE of the following.

6. Explain the components of Data Mining Algorithms.
7. Describe the data quality for individual measurements.
8. Describe multidimensional scaling in brief.
9. What are the desirable properties of Estimators?
10. Draw the table for well known data mining algorithms broken down in terms of their algorithm components.
11. List out the components of iterative local optimization algorithm.
12. Describe the features of partition based clustering algorithm.
13. Explain the computational issues in fitting the Model.

SECTION-C (5 x1 = 5 marks)

Answer ALL the questions

14. Define the term Exploratory Data analysis.
15. Define Tree classifiers.
16. Define Hierarchical clustering.
17. Define Linear Discriminants.
18. Define B-Trees.

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Paper-V : CRYPTOGRAPHY & NETWORK SECURITY

Time: Three hours

Maximum: 75 Marks

SECTION-A (3 x 15 = 45 marks)

Answer any THREE of the following.

1. Explain DES with one example.
2. Discuss AES cipher with one example.
3. Discuss about Blowfish.
4. Explain principles of Public Key crypto systems.
5. Discuss about Firewalls.

SECTION-B (5 x 5 = 25 marks)

Answer any FIVE of the following.

6. Discuss about Steganography.
7. Explain Block Cipher design principles.
8. Discuss about EUCLIDS Algorithm.
9. Write a note on RC5.
10. Write about RSA algorithm.
11. Discuss about Intrusion Detection.
12. Write about Digital Signature Standard.
13. Discuss about Trusted System.

SECTION-C (5 x1 = 5 marks)

14. Explain the following terms:
 - (a) Transposition cipher
 - (b) S-box.
 - (c) Triple Encryprition.
 - (d) Reply Attacks.
 - (e) Application level gateway.

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Paper- VI : ARTIFICIAL INTELLIGENCE

Time: Three hours

Maximum: 75 Marks

SECTION-A (3 x 15 = 45 marks)

Answer any THREE of the following.

1. Explain the representation of a problem in a state space with an example.
2. Describe the A* algorithm with suitable example.
3. Explain the concept of computable functions and prediction with an example.
4. Explain in detail about Matching.
5. Describe the various common sense ontologies in detail.

SECTION-B (5 x 5 = 25 marks)

Answer any FIVE of the following.

6. Enumerate the advantages of BFS & DFS algorithms.
7. Trace the constraint satisfaction procedure solving the following crypt arithmetic problem

$$\begin{array}{r} \text{C R O S S} \\ + \text{R O A D S} \\ \hline \text{D A N G E R} \end{array}$$

8. Explain various approaches to represent knowledge.
9. What is the need for natural deduction? Explain.
10. Explain in brief about Hill Climbing.
11. Compare and contrast forward versus backward reasoning.
12. Explain about augmenting a problem solver.
13. What is expert system and explain about expert system shells in detail.

SECTION-C (5 x 1 = 5 marks)

Answer ALL of the following.

14. What do you mean by state space search?
15. What is Heuristic function?
16. Define Instance and is a Relationship?
17. Define logic programming.
18. What is Memory Organization?