9214/A21 **OCTOBER 2009**

DISCRETE MATHEMATICS

Time : Three hours Maximum : 100 marks

PART A — ($6 \times 5 = 30$ marks)

Answer any SIX questions.

1. Explain any two relations with examples.

2. Prove that the equality of numbers on a set of real numbers is an equivalence relation.

3. Draw the truth table and circuit diagram for the OR and AND gates.

4. Define tautology and contradiction.

5. Explain the problem of Tower of Hanoi.

6. What is a recurrance relation? Explain with example.

7. Explain any two types of graphs with suitable example.

8. Define isomorphism of two graphs with examples.

9. Explain duality in lattices with example.

10. Define modular lattice. Write an example.

PART B — (4 × 10 = 40 marks)

Answer any FOUR questions.

11. Let $R = \{(x, 2x) / x \in I\}$ and $S = \{(x, 7x) / x \in I\}$ find R∘S, S∘R, R∘R, R∘S∘R, S∘R∘S.

12. Construct the truth table for

$$(p \wedge Q) \vee (\neg P \wedge R) \vee (Q \wedge R).$$

13. Prove that $(\exists x) M(x)$ follows logically from the premises $(x)(H(x) \rightarrow M(x))$ and $(\exists x) H(x)$.

14. Prove that a tree with n vertices has n-1 edges.

15. Prove that the maximum number of edges in a simple graph with n vertices is $n(n-1)/2$.

16. State and prove the modular inequality of a lattice.

PART C — (2 × 15 = 30 marks)

Answer any TWO questions.

17. (a) Let $X = \{1, 2, 3, 4, \cdots 7\}$ and $R = \{(x, y) / x - y \text{ is divisible by } 3\}$ show that R is an equivalence relation. Draw the graph of R.

(b) If $f : A \rightarrow B$ and $g : B \rightarrow C$ be bijective and prove that $(g \circ f)^{-1} = f^{-1} \circ g^{-1}$.

18. (a) Prove

$$P \rightarrow (Q \rightarrow R) \Leftrightarrow P \rightarrow (\neg Q \vee R) \Leftrightarrow (P \wedge Q) \rightarrow R.$$

(b) Explain Travelling sales man problem.

19. (a) Explain the applications of Boolean algebra to switching theory.

(b) Prove that every finite Boolean algebra is atomic.

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9215/A22 **OCTOBER 2009**

PROGRAMMING IN C++.

Time : Three hours Maximum : 100 marks

PART A — (6 × 5 = 30 marks)

Answer any SIX questions.

1. Describe about Data abstraction and encapsulation.

2. Describe about input Streams in C++.

3. How dynamic initialization of objects be handled in C++? Explain.

4. What is a constructor? How it is declared and defined? Explain.

5. Outline the advantages of functions.

6. Classify the different types of storage classes.

7. Describe about hierarchical inheritance.

8. Describe the operators that cannot be overloaded.

9. How the polymorphism be achieved? Explain.

10. What is virtual function? How can we define it? Explain.

PART B — (4 × 10 = 40 marks)

Answer any FOUR questions.

11. Describe the different forms of 'if' statement in detail.

12. Discuss the importance of Destructor.

13. Describe the different types of parameter passing schemes.

14. Describe the various C++ operators with examples.

15. Write a C++ program which overloading Binary Operators using Friends.

16. Discuss the benefits of object oriented programming.

PART C — (2 × 15 = 30 marks)

Answer any TWO questions.

17. Describe the uses of 'Do-while' and 'while' statements in C++. Outline the rules to be followed. Compare them with 'for' statement. (15)

18. (a) With suitable example C++ program, explain the concept of multilevel inheritance. (10)

(b) Discuss the needs and uses of recursive function. (5)

19. (a) Describe the uses of 'this' pointer in detail. (7)

(b) Outline rules to be followed while using virtual functions. (8)

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9216/A23 **OCTOBER 2009**

COMPUTER GRAPHICS

Time : Three hours Maximum : 100 marks

PART A — (6 × 5 = 30 marks)

Answer any SIX questions.

1. What are parallel and perpendicular lines? Explain.

2. How to generate characters?

3. What are device coordinates? Explain.

4. Explain How to thicken the line segments?

5. What are convex and concave polygon's? Explain.

6. Explain polygon. Flood fill algorithm.

7. Write HMR for translation and scaling.

8. Explain display procedures in detail.

9. Explain window and viewport.

10. Explain Midpt subdivision algorithm.

PART B — (4 × 10 = 40 marks)

Answer any FOUR questions.

11. What are Random scan and Rastu scan systems?

12. Explain beam penetration and shadow mask CRT's.

13. What are line attributes? Explain.

14. How to translate a real world scene to device coordinates?

15. Draw and explain the function of LCD's.

16. Explain the various 3D transformations.

PART C — (2 × 15 = 30 marks)

Answer any TWO questions.

17. Write the circle generation algorithm in detail.

18. Explain the various flatpanel devices available on computer graphics.

19. Write short notes on :

(a) Aspect ratio

(b) Positioning devices.

(c) Calligraphic displays.

9217/A24 **OCTOBER 2009**

OPERATING SYSTEMS

Time : Three hours Maximum : 100 marks

PART A — (6 × 5 = 30 marks)

Answer any SIX questions.

1. What do you mean by Buffering and Spooling? Explain.

2. Compare Non-Preemptive scheduling with preemptive scheduling.

3. Discuss the contents of Process Control Block.

4. Describe the memory management technique which support Non-multiprogramming environment.

5. Discuss the advantages of Demand Paging Memory Management.

6. Discuss about 'Early operating systems'.

7. Describe the physical characteristics of Disk.

8. Describe the various file operations.

9. What is meant by synchronous message exchange? Explain.

10. Compare Distributed Operating System with Network Operating System.

PART B — (4 × 10 = 40 marks)

Answer any FOUR questions.

11. Describe the hierarchical view of an operating system structure.

12. Describe the FCFS scheduling with an example.

13. Describe the seek optimization strategies – SCAN, E-SCAN.

14. Describe the various commands handled while working with DOS Directories.

15. With an example, explain the page replacement algorithm. Least Recently used.

16. How can we present dead locks? Explain in detail.

PART C — (2 × 15 = 30 marks)

Answer any TWO questions.

17. (a) Describe the Banker's Algorithm in detail.

(b) Describe the Paging memory Allocation in detail.

18. Describe the major functions of each categories of an operating system.

19. (a) Describe the various ways to access the information stores in the file.

(b) Describe the various system calls handled for basic file manipulation in Unix.

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9218/A25 **OCTOBER 2009**

COMPUTER ORGANISATION

Time : Three hours Maximum : 100 marks

PART A — (6 × 5 = 30 marks)

Answer any SIX questions.

1. What are interrupts? Explain.

2. Explain subroutines?

3. What is an instruction format?

4. What are data manipulation instructions?

5. Explain overlapped register window.

6. Explain synchronous data transfer.

7. What is a control memory? Explain.

8. Explain microprogram sequencer.

9. What is a hit ratio? Explain.

10. What do you mean by page replacement algorithm?

PART B — (4 × 10 = 40 marks)

Answer any FOUR questions.

11. Explain the design of control unit.

12. Write an ALP for sorting n numbers.

13. Draw and explain general register CPU organization.

14. Explain instruction cycle using an example.

15. Explain the purpose of an interface with peripherals?

16. Explain the design of RAM and ROM chips.

PART C — (2 × 15 = 30 marks)

Answer any TWO questions.

17. Discuss in detail the various addressing modes?

18. Draw and explain DMA.

19. What is a virtual memory? Discuss in detail the mapping procedure involved?

9219/A26 **OCTOBER 2009**

COMPUTER ALGORITHMS AND DATA STRUCTURES

Time : Three hours Maximum : 100 marks

PART A — ($6 \times 5 = 30$ marks)

Answer any SIX questions.

1. Write the general algorithm for divide and conquer.

2. What do you understand by time and space complexities?

3. Discuss briefly job sequencing with deadlines.

4. Apply the Greedy method to solve the Knapsack problem.

5. Explain the multistage graph problem.

6. What is 0/1 Knapsack problem? Explain.

7. What are queues? Write algorithm to insert and delete elements in a queue.

8. Write an algorithm to add two polynomials using liked representation.

9. Explain the binary tree travels with examples.

10. Differentiate between trees and binary trees.

PART B — (4 × 10 = 40 marks)

Answer any FOUR questions.

11. Write the algorithm to find minimum and maximum elements of the given set of numbers. Discuss its performance.

12. Explain the algorithm of selection sort with examples and analysis its time complexity.

13. Write an algorithm for single source shortest path problem using Greedy technique.

14. What is the travelling sales person problem? Explain.

15. Discuss the mazing problem with the algorithm to find a path in the maze.

16. Discuss the hashing functions.

PART C — (2 × 15 = 30 marks)

Answer any TWO questions.

17. Discuss the use of Greedy method in optimal storage on Tapes. Compute its efficiency in comparison with sequential storage.

18. What is divide and conquer method? Explain binary search algorithm using above method and find its complexities.

19. Discuss the evaluation of expression along with the algorithm for infix to postfix conversion.

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