D–8486

Sub. Code
31511

DISTANCE EDUCATION

M.C.A. DEGREE EXAMINATION, MAY 2025.

First Semester

DIGITAL COMPUTER ORGANIZATION

(CBCS 2018 – 2019 / 2020 Academic Year Onwards)

Time : Three hours Maximum : 75 marks

PART A — ($10 \times 2 = 20$ marks)

Answer ALL the questions.

1. Mention the use of complements.

2. State De Morgan's theorems.

3. Write down the truth table of three input full adder.

4. What is flip flop?

5. What are called instruction codes?

6. What is the purpose of an interrupt?

7. What is stack organization?

8. Give the names of any two peripheral devices.

9. What do you mean by Auxiliary memory?

10. Write down the functions of cache buffer.

PART B — ($5 \times 5 = 25$ marks)

Answer ALL questions, choosing either (a) or (b).

11. (a) Write about numeric and character codes.

Or

(b) Explain any five basic theorems of Boolean algebra.

12. (a) Draw the block diagram of a 4-to-1-line multiplexer and explain the operation by means of a function table.

Or

(b) Explain fixed point and floating point representations.

13. (a) Write short notes on computer registers.

Or

(b) Outline the design of accumulator logic.

14. (a) Explain about Asynchronous Data transfer.

Or

(b) Explain the concept of DMA.

15. (a) Illustrate the functions of Associative memory.

Or

(b) Discuss about virtual memory.

PART C — ($3 \times 10 = 30$ marks)

Answer any THREE questions.

16. Simplify the following using K-map :

$F = (W, X, Y, Z) = \Sigma(2, 3, 12, 13, 14, 15)$

17. Explain how shift registers are used to perform arithmetic operations.

18. Explain instruction cycle with memory reference instructions.

19. List and explain the various addressing modes with suitable example.

20. Describe the memory organization of digital computer.

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D–8487

Sub. Code
31512

DISTANCE EDUCATION

M.C.A. DEGREE EXAMINATION, MAY 2025.

First Semester

OBJECT ORIENTED PROGRAMMING AND C++

(CBCS 2018 – 2019 / 2020 Academic Year Onwards)

Time : Three hours Maximum : 75 marks

PART A — ($10 \times 2 = 20$ marks)

Answer ALL the questions.

1. Define encapsulation and its importance.

2. What are the predefined console streams?

3. What is the difference between public and private members in a C++ class?

4. How do you declare a private member function in a class?

5. What is operator overloading in C++?

6. Differentiate between implicit and explicit conversion in C++.

7. Can we inherit a template class? Justify.

8. How do you open a file for reading and writing in C++?

9. How do you handle exception in C++?

10. What are the best practices for handling exceptions in operator overloaded functions?

PART B — ($5 \times 5 = 25$ marks)

Answer ALL questions, choosing either (a) or (b).

11. (a) Write down the evolution of object oriented language.

Or

(b) Write a short notes on manipulators.

12. (a) Demonstrate the use of "this" pointer in C++.

Or

(b) Write a C++ program to demonstrate the use of classes and objects.

13. (a) Write a C++ program that uses polymorphism to calculate areas of rectangle.

Or

(b) Explain about the hybrid inheritance with an example.

14. (a) Write short notes on file pointers and their manipulations.

Or

(b) Write a C++ program that uses templates to create a generic container class.

15. (a) Explain catching mechanism with an example.

Or

(b) How to handle memory allocation failure exception in C++? Explain.

PART C — ($3 \times 10 = 30$ marks)

Answer any THREE questions.

16. Describe the basic concepts of object oriented programming.

17. Write a C++ program to demonstrate the use of constructors and destructors.

18. What is virtual function? Write a C++ program illustrating virtual function.

19. Explain function template with multiple arguments through an example.

20. Write a C++ program that uses exception handling with constructors and destructors.

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D–8488

Sub. Code
31513

DISTANCE EDUCATION

M.C.A. DEGREE EXAMINATION, MAY 2025.

First Semester

DATA STRUCTURE AND ALGORITHMS

(CBCS 2018 – 2019 / 2020 Academic Year Onwards)

Time : Three hours Maximum : 75 marks

PART A — ($10 \times 2 = 20$ marks)

Answer ALL the questions.

1. Distinguish between linear and nonlinear data structures.

2. What is the difference between O(1) and O(n)?

3. Distinguish between stack and queue.

4. What are the advantages of linked list over arrays?

5. Define a fully binary tree. Give an example.

6. State the complexity of binary tree.

7. Give the fastest searching algorithm.

8. Write the time complexity of quick sort and tree sort.

9. What is meant by internal and external sorting? Give any two examples for each type.

10. Write the complexity of selection sort.

PART B — ($5 \times 5 = 25$ marks)

Answer ALL questions, choosing either (a) or (b).

11. (a) What is space complexity? Explain in detail.

Or

(b) Explain the characteristics and operations of arrays.

12. (a) What are the ways to insert a node in linked list? Write an algorithm for inserting a node before a given node in a linked list.

Or

(b) Explain the applications of queue with suitable example.

13. (a) Describe an iterative algorithm to traverse a tree in preorder.

Or

(b) When do you perform rehashing? Illustrate with an example.

14. (a) Write an algorithm to perform a binary search.

Or

(b) Write the steps to convert general tree to binary tree.

15. (a) State and explain Radix sort with suitable example.

Or

(b) Sort the following array using Tree sort : 77,33,44,11,88,22,66.

PART C — ($3 \times 10 = 30$ marks)

Answer any THREE questions.

16. Explain in detail about two-dimensional array with an example.

17. Write a procedure to convert the infix expression to postfix expression and steps involved in evaluating the postfix expression. Convert the expression $A-(B/C+(D\%E*F)/G)*H$ to postfix form.

18. How to insert and delete an element in a binary search tree and write down the code for insertion routine.

19. Distinguish between linear search and binary search. State and explain the algorithms for both the search with examples.

20. Write an algorithm to sort a set of 'N' numbers using Bubble sort. Demonstrate the algorithm for the following set of numbers : 88,11,45,67,98,33,68,55,11.

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D–8489

Sub. Code
31522

DISTANCE EDUCATION

M.C.A. DEGREE EXAMINATION, MAY 2025.

Second Semester

RELATIONAL DATABASE MANAGEMENT SYSTEMS (RDBMS)

(CBCS 2018 / 2020 Academic Year Onwards)

Time : Three hours Maximum : 75 marks

PART A — ($10 \times 2 = 20$ marks)

Answer ALL the questions.

1. What is meant by database schema?

2. Define the term entity.

3. Write the SQL command to modify data in a table.

4. Write the syntax for inner join.

5. Define decomposition in normal form.

6. What is the purpose of nested queries?

7. Define the term atomicity in DBMS.

8. What is the use of backing up data?

9. What is meant by indexed sequential access method?

10. What are the features of clustered index?

PART B — ($5 \times 5 = 25$ marks)

Answer ALL questions, choosing either (a) or (b).

11. (a) Discuss about DDL commands in SQL.

Or

(b) Write in detail about database users and administrators.

12. (a) Explain the term selection and projection in relational algebra.

Or

(b) Distinguish between Tuple relational calculus and domain relational calculus.

13. (a) How do you retrieve null values from the database? Explain.

Or

(b) Discuss about second normal form with an example.

14. (a) Narrate lock based protocols.

Or

(b) Write short notes on buffer management.

15. (a) Compare and contrast primary and secondary indexes.

Or

(b) Write short notes on file organization structure.

PART C — ($3 \times 10 = 30$ marks)

Answer any THREE questions.

16. Describe the database languages with examples.

17. Write about logical database design with suitable examples.

18. How BCNF differs from 3NF? Explain with an example.

19. Explain the features of recoverability of data.

20. Write in detail about Hash based indexing and tree based indexing.

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D–8490

Sub. Code
31523

DISTANCE EDUCATION

M.C.A. DEGREE EXAMINATION, MAY 2025.

Second Semester

COMPUTER GRAPHICS

(CBCS 2018-2019 / 2020 Academic Year Onwards)

Time : Three hours Maximum : 75 marks

PART A — ($10 \times 2 = 20$ marks)

Answer ALL the questions.

1. Write down the applications of computer graphics.

2. What is Joystick?

3. What is called shear?

4. Define composite transformation.

5. Define polygon surface.

6. Define B-Spline surface.

7. What are implicit and explicit curves?

8. What is 3D scaling?

9. What are the limitations of back-face detection methods?

10. Define depth buffer.

PART B — ($5 \times 5 = 25$ marks)

Answer ALL questions, choosing either (a) or (b).

11. (a) Write short notes on line drawing algorithms with a neat structure.

Or

(b) Discuss briefly about Boundary-fill algorithm with a neat structure.

12. (a) Explain briefly about Cohen-Sutherland line Clipping algorithm with a neat structure.

Or

(b) What is 2D rotation? Discuss with a neat structure.

13. (a) Write short notes on Bezier curves with a neat structure.

Or

(b) Discuss on basic illumination models.

14. (a) Write a brief note on viewport coordinates.

Or

(b) Elaborate on reflection and shear transformation with a neat structure.

15. (a) Discuss Briefly about scan - line method with a neat structure.

Or

(b) Write short notes on area subdivision method with a neat structure.

PART C — ($3 \times 10 = 30$ marks)

Answer any THREE questions.

16. Explain in detail about various video display devices with a neat structure.

17. Write a detailed notes on composite transformations with a neat structure.

18. Describe in detail about Polygon rendering methods.

19. Elaborate on projections and its types in computer graphics.

20. With neat structure, discuss about binary space partitioning trees in computer graphics.

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D–8491

Sub. Code
31532/34032

DISTANCE EDUCATION

M.C.A./M.C.A.(Lateral Entry) DEGREE EXAMINATION, MAY 2025.

Third Semester

OPERATING SYSTEM

(CBCS 2018 / 2020 Academic Year Onwards)

Time : Three hours Maximum : 75 marks

PART A — ($10 \times 2 = 20$ marks)

Answer ALL the questions.

1. Define the term operating system.

2. What is interrupt handling?

3. Define thread.

4. Define process state.

5. Define mutual exclusion.

6. What is the use of Banker's algorithm?

7. What is memory management strategy in OS?

8. What are the advantages of memory management?

9. Define file structure.

10. What is sub-directory?

PART B — ($5 \times 5 = 25$ marks)

Answer ALL questions, choosing either (a) or (b).

11. (a) Brief on the operations of an operating system.

Or

(b) What are operating system services? Explain.

12. (a) Write short notes on various operations on processes.

Or

(b) Discuss on round Robin scheduling algorithm with an example.

13. (a) What is called Semaphore? Write a brief note on depth buffer method. Discuss about its types.

Or

(b) List out the characteristics of deadlock.

14. (a) What is paging in OS? Explain with a neat structure.

Or

(b) What is segmentation in OS? Discuss about its types.

15. (a) Write short notes on free space management in OS.

Or

(b) What is file sharing? Discuss about its types.

PART C — ($3 \times 10 = 30$ marks)

Answer any THREE questions.

16. Write detailed notes on operating system design and implementation.

17. Elaborate on Interprocess communication with a neat structure.

18. Give a detailed notes on classic problem of synchronization.

19. Describe in detail about contiguous memory management techniques.

20. Discuss in detail about file allocation methods in OS.

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