| D–6501 | Sub. Code |
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| | 31511 |

DISTANCE EDUCATION

M.C.A. DEGREE EXAMINATION, DECEMBER 2024.

First Semester

DIGITAL COMPUTER ORGANIZATION

(CBCS 2018 / 2020 Academic Year Onwards)

Time : Three hours Maximum : 75 marks

SECTION A — ($10 \times 2 = 20$ marks)

Answer ALL the questions.

1. Find 2's complements for the following binary numbers : (a) 1000 0001 (b) 0011 0110.

2. Simplify the expression (A'B'C'+B'CD'+A'BCD'+AB'C') using Boolean algebra.

3. Define the term full adder.

4. What is meant by latch?

5. What are memory reference instructions?

6. What is meant by addressing?

7. Define the term stack.

8. What are the modes of transfer?

9. Differentiate between static and dynamic random access memory.

10. What are significance of levels of cache?

SECTION B — ($5 \times 5 = 25$ marks)

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

11. (a) Write short notes on binary subtraction.

Or

(b) Describe the fundamental concepts of Boolean algebra.

12. (a) Give a brief account on half adder and full adder.

Or

(b) Describe floating point representation with examples.

13. (a) Briefly explain about computer registers.

Or

(b) Brief on the design of accumulator logic.

14. (a) Explain three types of instruction formats with example.

Or

(b) Write short notes on peripheral devices.

15. (a) Discuss on associative memory.

Or

(b) What do you mean by virtual memory? How virtual address is translated into physical address?

SECTION C — ($3 \times 10 = 30$ marks)

Answer any THREE questions.

16. Simplify the following Boolean expression using K-map : $F(A, B, C, D) = \Sigma(0,2,4,5,6,7,8,10,13,15)$.

17. List and explain the functionality of any two types of flip flop.

18. What is the instruction cycle? Describe the phases of instruction cycle.

19. Explain the use of DMA controller in a computer system with a neat diagram.

20. Describe in detail the Memory hierarchy.

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| D–6502 | Sub. Code |
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| | 31512 |

DISTANCE EDUCATION

M.C.A. DEGREE EXAMINATION, DECEMBER 2024.

First Semester

OBJECT ORIENTED PROGRAMMING AND C++

(CBCS 2018 / 2020 Academic Year Onwards)

Time : Three hours Maximum : 75 marks

SECTION A — (10 × 2 = 20 marks)

Answer ALL the questions.

1. Define : Dynamic binding.

2. What is a stream?

3. What are the limitations of C structure?

4. Mention the two parts of class specification.

5. Define the term reusability.

6. What is the use of this pointer?

7. Distinguish between input and output streams.

8. What is a macro?

9. Define : Asynchronous exception.

10. When a program thrown an exception?

SECTION B — ($5 \times 5 = 25$ marks)

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

11. (a) Distinguish between put( ) and get( ) functions.

Or

(b) Discuss about manipulators.

12. (a) What are the merits and demerits of using friend functions? Explain.

Or

(b) Explain parameterized constructors through an example.

13. (a) How members in a class are accessed in single inheritance? Discuss.

Or

(b) Discuss unary operator overloading, giving an example.

14. (a) Explain in detail about file streaming classes.

Or

(b) How to create a class template? Explain.

15. (a) Write a note on try and catch statements.

Or

(b) Explain about memory allocation failure exception.

SECTION C — ($3 \times 10 = 30$ marks)

Answer any THREE questions.

16. Describe the basic concepts of object oriented programming.

17. Illustrate array of objects with an example program.

18. Briefly explain about multilevel inheritance with suitable example.

19. Elaborate on sequential I/O operations.

20. Explain exception handling in constructors and destructors.

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| D–6503 | Sub. Code |
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| | 31513 |

DISTANCE EDUCATION

M.C.A. DEGREE EXAMINATION, DECEMBER 2024.

First Semester

DATA STRUCTURE AND ALGORITHMS

(CBCS 2018 / 2020 Academic Year Onwards)

Time : Three hours Maximum : 75 marks

SECTION A — ($10 \times 2 = 20$ marks)

Answer ALL the questions.

1. Write down the definition of data structure. Give two examples for it.

2. What are the salient features of an efficient algorithm?

3. What are the applications of queue?

4. Write an example for infix and postfix expression.

5. What are the two methods of binary tree implementation?

6. Define the term 'Height of tree'.

7. Define the term complete binary tree.

8. What is linear search?

9. What is meant by sorting?

10. State the logic behind bubble sort algorithm.

SECTION B — ($5 \times 5 = 25$ marks)

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

11. (a) Explain various characteristics of an array.

Or

(b) Discuss on various types of data structure.

12. (a) Explain the working principle of circular linked list.

Or

(b) Explain any two applications of stack with examples.

13. (a) Brief on different ways of representing linked list.

Or

(b) How do you insert an element into a binary search tree? Explain.

14. (a) Explain different ways of representing a binary tree.

Or

(b) Write an algorithm for binary search and explain the steps with illustrations.

15. (a) Write an algorithm to implement radix sort. Demonstrate it with suitable example.

Or

(b) Sort the following numbers using selection sort :

89, 45, 14, 39, 41, 80, 35, 77.

SECTION C — ($3 \times 10 = 30$ marks)

Answer any THREE questions.

16. Explain in detail about multi-dimensional array with suitable examples.

17. Write an explain the algorithm to create, insertion and traverse a doubly linked list with illustrations.

18. Explain the various types of tree traversal with suitable example diagrams.

19. Elaborate on Hashing techniques.

20. Explain how to sort the elements using insertion sort algorithm and derive time complexity for the same.

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| D–6504 | Sub. Code |
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| | 31522 |

DISTANCE EDUCATION

M.C.A. DEGREE EXAMINATION, DECEMBER 2024.

Second Semester

RELATIONAL DATABASE MANAGEMENT SYSTEMS
(RDBMS)

(CBCS 2018 / 2020 Academic Year Onwards)

Time : Three hours Maximum : 75 marks

SECTION A — ($10 \times 2 = 20$ marks)

Answer ALL the questions.

1. What does RDBMS stand for?

2. Name the language used to interact with RDBMS databases.

3. Which database model is the basis for RDBMS?

4. What is a primary key in a relational database?

5. Define normalization in the context of RDBMS.

6. What is the purpose of foreign keys in a database?

7. Name one popular open-source RDBMS.

8. What does SQL stand for?

9. Differentiate between a database and a table in RDBMS.

10. Explain the concept of data integrity in RDBMS.

SECTION B — ($5 \times 5 = 25$ marks)

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

11. (a) What are Data models? Explain it.

Or

(b) Explain DML commands.

12. (a) Write and explain quering relational data.

Or

(b) Write a short note on tuple relational calculus with example.

13. (a) What are the types of forms? Explain.

Or

(b) Explain : impact on SQL constructs.

14. (a) Write a detail note on recoverability.

Or

(b) Write a short notes on tree base indexing.

15. (a) Explain Hash based indexing in detail.

Or

(b) What are the indexed sequential access methods? Explain it.

SECTION C — ($3 \times 10 = 30$ marks)

Answer any THREE questions.

16. Explain : Data base design and ER diagrams.

17. Explain : Complex integrity constraints in SQL.

18. Explain : Dependency preserving decomposition in detail.

19. List out and explain the Lock based protocols.

20. Write a detailed note on dynamic index structure.

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| D–6505 |
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| Sub. Code |
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| 31523 |

DISTANCE EDUCATION

M.C.A. DEGREE EXAMINATION, DECEMBER 2024.

Second Semester

COMPUTER GRAPHICS

(CBCS 2018 / 2020 Academic Year Onwards)

Time : Three hours Maximum : 75 marks

SECTION A — ($10 \times 2 = 20$ marks)

Answer ALL the questions.

1. Bring out the reasons for using computer graphics.

2. Write down the features of computer Graphics.

3. What is geometric transformation in computer graphics?

4. What is clipping in computer graphics? Give an example.

5. How are 3D objects represented in computer graphics?

6. What are the applications of curves in computer graphics?

7. How do you view 3D objects in computer graphics?

8. Which projection gives realistic effect?

9. What is visible surface detection in computer graphics?

10. What are the types of animation in computer graphics?

SECTION B — ($5 \times 5 = 25$ marks)

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

11. (a) List out the applications of computer graphics.

Or

(b) What is video display device? Describe about cathode ray tube with a neat diagram.

12. (a) What is scaling? Briefly discuss about it with illustrations.

Or

(b) What are composite transformations? Explain.

13. (a) What are polygon surfaces in computer graphics? Explain with illustrations.

Or

(b) What are hermite curves? Bring out its limitations.

14. (a) What is translation in a 3D geometric transformation? Illustrate it.

Or

(b) What is scaling transformation? Give its types with neat sketch.

15. (a) What is scan line polygon fill algorithm? List out its advantages.

Or

(b) What are raster and vector graphics in computer graphics? Brief on raster animation.

SECTION C — ($3 \times 10 = 30$ marks)

Answer any THREE questions.

16. Elaborate on Bresenham's line drawing algorithm with illustrations.

17. Explain the following with necessary diagrams.

    (a) 2D Rotation transformation

    (b) 2D shear transformation.

18. What is Bezier curve? Describe in detail about its properties.

19. What is projection in computer graphics? Explain in detail about its types with illustrations.

20. What are BSP trees? Describe in detail about its types with necessary diagrams.

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**D–6506**

| Sub. Code |
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| 31532/34032 |

DISTANCE EDUCATION

M.C.A./M.C.A.(Lateral Entry) DEGREE EXAMINATION, DECEMBER 2024.

Third Semester

OPERATING SYSTEM

(CBCS 2018/2020 Academic Year Onwards)

Time : Three hours Maximum : 75 marks

SECTION A — ($10 \times 2 = 20$ marks)

Answer ALL the questions.

1. What do you mean by computer organization?

2. What are the three services in operating system?

3. What is IPC connection?

4. What do you mean by scheduling?

5. What is synchronization on OS?

6. What causes deadlock?

7. What are the basic min memory allocation strategies?

8. Which order of memory allocation in best?

9. What is file structure in operating system?

10. What is a secondary storage structure in operating system?

SECTION B — ($5 \times 5 = 25$ marks)

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

11. (a) Discuss briefly about the organization of an operating system.

Or

(b) Write short notes on system calls.

12. (a) What is process scheduling? Explain.

Or

(b) Bring out various criteria to be considered for scheduling.

13. (a) Discuss briefly about the critical section problem.

Or

(b) What are the methods involved in handling deadlock?

14. (a) With a neat structure discuss about contiguous memory allocation.

Or

(b) What is swapping? Explain with its structure.

15. (a) Discuss briefly about the concept of file sharing.

Or

(b) Write short notes on disk structure.

SECTION C — ($3 \times 10 = 30$ marks)

Answer any THREE questions.

16. Elaborate on the operations of an operating system.

17. What is inter process communication? Explain about process with a neat diagram.

18. What are called semaphores? Discuss in detail.

19. What is called paging? Explain in detail with its structure.

20. What is free space management? Explain in detail about any one of its type.

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**D–6512**

| Sub. Code |
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| 31561/34061 |

DISTANCE EDUCATION

M.C.A./M.C.A.(Lateral Entry) DEGREE EXAMINATION, DECEMBER 2024.

Sixth Semester

CLOUD COMPUTING

(CBCS 2018 – 2019 Academic Year Onwards)

Time : Three hours Maximum : 75 marks

SECTION A — (10 × 2 = 20 marks)

Answer ALL the questions.

1. Write any two advantages of cloud computing.

2. List out the types of cloud service development.

3. Define event marketing.

4. What do you mean by virtual company?

5. Mention the uses of windows live calendar.

6. Define workflow management.

7. What are the four levels of federation?

8. Write any two issues in cloud.

9. What type of cloud is nimbus?

10. What are the three main cloud computing deployment models?

SECTION B — ($5 \times 5 = 25$ marks)

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

11. (a) Enumerate the Pros and Cons of cloud service development.

Or

(b) Write short note on collaborative computing and distributed computing.

12. (a) Write a short note on collaborating on school projects.

Or

(b) Illustrate the steps to centralizing Email communications.

13. (a) Enumerate the event management applications in detail.

Or

(b) How does online databases work? Discuss about it.

14. (a) Illustrate about software as a security service.

Or

(b) Briefly explain the privacy in cloud.

15. (a) Write short note on Eucalyptus cloud tool.

Or

(b) What are the two types of nimbus clouds? Discuss it.

SECTION C — ($3 \times 10 = 30$ marks)

Answer any THREE questions.

16. Explain in detail about the cloud services development services and tools.

17. Briefly explain the concepts of collaborating on schedules on cloud computing.

18. Write brief note on online file-storage and file-sharing services.

19. Enumerate the cloud file system and map reduce methods.

20. Discuss in detail the open nebula open source cloud tool.

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**D–6513**

| Sub. Code |
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| 31562/34062 |

DISTANCE EDUCATION

M.C.A./M.C.A.(Lateral Entry) DEGREE EXAMINATION,
DECEMBER 2024.

Sixth Semester

SOFT COMPUTING

(CBCS 2018 – 2019 Academic Year Onwards)

Time : Three hours Maximum : 75 marks

SECTION A — ($10 \times 2 = 20$ marks)

Answer ALL the questions.

1. Define dendrites.

2. Define perceptron.

3. What is meant by adaline network?

4. Draw multi layer neural network.

5. What is meant by evaluation function?

6. Write a note on defuzzification.

7. Define extension principle.

8. Write general membership function.

9. Differentiate traditional vs genetic algorithm.

10. Define double crossover.

SECTION B — ($5 \times 5 = 25$ marks)

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

11. (a) Write a note on soft computing.

Or

(b) Write a note on hybrid systems.

12. (a) What are layers in ANN? Explain.

Or

(b) Explain the two activation functions in ANN.

13. (a) Explain about rule aggregation in fuzzy.

Or

(b) List any two operations of fuzzy set.

14. (a) Write a note on fuzzy measures.

Or

(b) Describe fuzzy decomposition.

15. (a) Describe the types of fitness function.

Or

(b) Write a note on schema theorem.

SECTION C — ($3 \times 10 = 30$ marks)

Answer any THREE questions.

16. Explain in detail about building the blocks of ANN.

17. Describe about ART networks and its functionality.

18. Explain in detail about fuzzy equivalence functions.

19. Discuss about FLC systems.

20. Discuss the applications of genetic algorithm.

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**D–6514**

| Sub. Code |
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| 31563/34063 |

DISTANCE EDUCATION

M.C.A./M.C.A.(Lateral Entry) DEGREE EXAMINATION,
DECEMBER 2024.

Sixth Semester

BIG DATA ANALYTICS

(CBCS 2018 – 2019 Academic Year Onwards)

Time : Three hours Maximum : 75 marks

SECTION A — (10 × 2 = 20 marks)

Answer ALL the questions.

1. List the characteristics of big data.

2. Specify any two components of Hadoop.

3. What is reducer?

4. Define query processing.

5. What are decaying windows?

6. List any two social networks.

7. Define page rank.

8. What is social graphs?

9. Define social network mining.

10. What is clustering?

SECTION B — ($5 \times 5 = 25$ marks)

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

11. (a) What are the limitations of Hadoop? Explain.

Or

(b) Discuss the concept of core hadoop components.

12. (a) How do you find the similar items? Explain.

Or

(b) Discuss in detail about applications of nearest neighbor search.

13. (a) How do you use data streams mining? Explain.

Or

(b) Write a short note on counting distinct elements in a system.

14. (a) Discuss in detail about history of search engines and spam.

Or

(b) How do you use the Hubs and authorities? Explain.

15. (a) Discuss in detail about social graphs.

Or

(b) How do you use the counting triangles in a social graph? Explain.

SECTION C — ($3 \times 10 = 30$ marks)

Answer any THREE questions.

16. Explain the technologies available for Big data.

17. Clarify the concept of recommendation based on user ratings.

18. What is data stream? List out the examples of data stream applications.

19. How do you compute the efficient computation of page rank? Explain briefly.

20. Discuss in detail about types of social graphs.

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