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–8495

Sub. Code
31514

DISTANCE EDUCATION

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

First Semester

Computer Applications

DISCRETE MATHEMATICS

(CBCS 2020 – 2021 Academic Year Onwards)

Time : Three hours Maximum : 75 marks

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

Answer ALL questions.

1. Show that the propositions $P \to Q$ and $\neg P \vee Q$ are logically equivalent.

2. Write the power set for $X = \{b, c, d\}$

3. If the relation is $R = \{(1, 2), (2, 3), (3,4)\}$, then verify it is transitive or not.

4. When do you say that a relation R as equivalence relation?

5. Define identity element for a binary operation.

6. Let A and B be any two subsets of a universal set $\cup$. Then what is $\psi A \cup B(x)$.

7. In an abelian group $(G.*)$, prove that $(a*b)^2 = a^2 * b^2 \forall\ a, b \in G$.

8. If $a*b = a$ for $a, b \in S$, then verify that $(S,*)$ is a semi group or not?

9. Define Pseudo graph.

10. Consider an experiment of throwing a die. What is the probability of getting 3?

SECTION B — ($5 \times 5 = 25$ marks)

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

11. (a) Show that the following argument is valid. "If today is Tuesday, I have a test in Mathematics or Economics. If my Economics Professor is sick I will not have a test in Economics. Today is Tuesday and my Economics Professor is sick. Therefore I have a test in Mathematics".

Or

(b) Prove that
$(\forall x)\ (P(x) \to Q(x)), (\forall x)\ (R(x) \to \exists Q(x)) \Rightarrow$
$\forall x(R(x) \to \neg P(x))$.

12. (a) Let $A = \{a, b, c, d, e\}$ and R is a relation on A and defined as $R = (a, a), (a, b), (a, d)$ (b, a) $(b,b), (b, c), (b, d), (c, a), (c, d), (c, e), (d, c), (d,e),$ (e, e). The draw the digraph for this relation.

Or

(b) Let $X = \{1, 2, 3, 4,\}$ and $R = \{(1,2), (2, 3), (3,4)\}$ be a relation on X. Find R^+.

13. (a) Let $f(x) = x + 2$, $g(x) = x - 2$ and $h(x) = 3x$ for $x \in R$, where R is the set of real numbers. Find gof; fog; fof gog; foh; hog; hof; and $fohog$.

Or

(b) Let f be the function from $\{a, b, c\}$ to $\{1, 2, 3\}$ such that $f(a) = 2$, $f(b) = 3$, and $f(c) = 1$. Is f invertible and if it is, what is its inverse?

14. (a) Show that the set of the all positive rational numbers Q^+ form an abelian group under the operation * defined by $a * b = \frac{1}{2}ab$.

Or

(b) Every subgroup of an abelian group is normal.

15. (a) Prove that in a graph $G = (V, E)$, the number of vertices with odd degree in even.

Or

(b) Suppose E is the event that a randomly generated bit string of length four begins with a 1 and F is the event that this bit string contains an even number of 1s. Are E and F independent, if the 16 bit strings of length four are equally likely'?

SECTION C — (3 × 10 = 30 marks)

Answer any THREE questions.

16. Show that the premises, "one student in this class knows java program", "Everyone who knows java program can get high paying job", imply the conclusion that "Someone in this class can get a high paying job".

17. Draw the Hasse diagram representing the partial ordering $\{(a, b) \mid a \text{ divides } b\}$ on $\{1, 2, 3, 4, 6, 8, 12\}$.

18. (a) Let $X = \{a, b, c, d\}$ and $Y = \{1, 2, 3, 4\}$ and let $f : X \to Y$ be given by $f(a) = 1$, $f(b) = 2$, $f(c) = 2$, $f(d) = 3$. Is f^{-1} a function.

(b) Let $f : R \to R$, where R is the set of real numbers, defined by $f(x) = x + 5$, then prove that f is one-to-one and onto.

19. State and prove Lagrange's theorem on group.

20. Let, one person in 100,000 has a particular rare disease for which there is a fairly accurate diagnostic test. This test is correct 99.0% of the time when given to a person selected at random who has the disease; it is correct 99.5% of the time when given to a person selected at random who does not have the disease. Given this information can we find the probability that a person who tests positive for the disease has the disease?

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D–8496	Sub. Code
	31521

DISTANCE EDUCATION

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

Second Semester

ACCOUNTING AND FINANCIAL MANAGEMENT

(CBCS 2020 – 2021 Academic Year Onwards)

Time : Three hours Maximum : 75 marks

PART A — ($10 \times 2 = 20$ marks)

Answer ALL the questions.

1. What is Money Measurement Concept?

2. Define Trial Balance.

3. State the basic functions of management accounting.

4. Determine the amount of variable cost from the following information sales Rs. 1,50,000 Fixed cost Rs. 30,000 Profit Rs. 40,000.

5. State the advantages of standard costing.

6. What do you mean by a budget?

7. Mention any two objectives of financial management.

8. State any two components of working capital.

9. What is equity capital?

10. Write a note on dividend decision.

PART B — (5 × 5 = 25 marks)

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

11. (a) Explain any six types of Accounting Concepts.

Or

(b) Prepare trading and profit and loss account from the following information given below

Particulars	Amount	Particulars	Amount
Opening Stock	3,600	Carriage Outwards	400
Purchases	18,260	Sales Returns	700
Wages	3,620	Purchase Returns	900
Closing Stock	4,420	General expenses	900
Sales	32,000	Discount allowed	360
Carriage Inwards	500	Interest received	200

12. (a) Given the following, Calculate P/V Ratio and profit when sales are Rs. 20,000, Fixed cost Rs. 4,000, Break even point Rs. 10,000.

Or

(b) Discuss the scope of management accounting.

13. (a) The standard material required for production is 10,500 kgs. A price of Rs. 2 per kg has been fixed for the materials. The actual quantity of materials used for the product is 11,000 Kgs. A sum of Rs 24,750 has been paid for the materials.

Calculate

(i) Material cost variance

(ii) Material Rate variance

(iii) Material usage variance.

Or

(b) A manufacturing company submits the following figures of product X for the first quarter of 2001

Sales	Units
January	30,000
February	25,000
March	35,000

Sales price per unit Rs. 20,

Target of first quarter 2002

Sales quantity increase 10%

Sales price increase 10%

Prepare sales budget for the first quarter of 2002.

14. (a) Discuss the functions of financial management.

Or

(b) Explain the basic methods of investment appraisal.

15. (a) Examine the different types of dividend policy.

Or

(b) Determine the importance of weighted average cost of capital.

PART C — ($3 \times 10 = 30$ marks)

Answer any THREE questions.

16. Prepare a trading and profit and loss account for the year ended 31.12.1992 and a balance sheet as on that date from the following trial balance of Mr. Madan

Particulars	Amount	Particulars	Amount
Sundry debtors	92,000	Madans Capital	70,000
Plant and machinery	20,000	Bank overdraft	20,000
Interest	430	Creditors	60,000

Particulars	Amount	Particulars	Amount
Rent rates and taxes	5,600	Purchase return	2,600
Conveyance charges	1,320	Sales	2,50,000
Wages	7,000		
Sales returns	5,400		
Purchases	1,50,000		
Opening stock	60,000		
Madans drawings	22,000		
Trade expenses	1,350		
Salaries	11,200		
Advertising	840		
Discount	600		
Bad debts	800		
Business premises	12,000		
Furniture and fixtures	10,000		
Cash in hand	2,060		
Total	4,02,600	Total	4,02,600

Adjustments

(a) Closing stock Rs. 90,000

(b) Depreciate on business premises @2.5%, Plant and Machinery @ 7.5%, furniture and fixture @10%

(c) Write off bad debts Rs. 800

(d) Provide for doubtful debts at 5% on sundry debtors

(e) Outstanding rent Rs. 500 and outstanding wages Rs. 400

(f) Prepaid insurance Rs. 300 and prepaid salaries Rs. 700.

17. The following figures of sales and profits for two periods are available in respect of a concern

Year	Sales	Profit
2019	1,00,000	15,000
2020	1,20,000	23,000

You are required to find out

(a) P/V ratio

(b) Fixed Cost

(c) Break Even point

(d) Profit at an estimated sale of Rs. 1,25,000

(e) Sales required to earn a profit of Rs. 20,000.

18. The following information at 50% capacity is given. Prepare a flexible budget and forecast the profit or loss at 60%, 70% and 90% capacity.

Fixed expenses-Expenses at 50% capacity	Variable expenses-Expenses at 50% capacity	Semi variable expenses-Expenses at 50% capacity
Salaries – 50,000	Materials – 2,00,000	Repairs – 1,00,000
Rent and taxes — 40,000	Labour – 2,50,000	Indirect Labour – 1,50,000
Depreciation – 60,000	Others – 40,000	Others – 90,000
Administrative expenses – 70,000		

It is estimated that fixed expenses will remain constant at all capacities. Semi variable expenses will not change between 45% and 60% capacity, will rise by 10% between 60% and 75% capacity, a further increase of 5% when capacity crosses 75%.

Estimated sales at various levels of capacity are

Capacity	–	Sales
60%	–	11,00,000
70%	–	13,00,000
90%	–	15,00,000

19. Explain the various factors influencing working capital.

20. Illustrate the determinants of capital structure.

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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–8497

Sub. Code
31524

DISTANCE EDUCATION

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

Second Semester

VISUAL PROGRAMMING WITH .NET

(CBCS 2020 – 2021 Academic Year Onwards)

Time : Three hours Maximum : 75 marks

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

Answer ALL the questions.

1. Mention any two differences between the Toolbar and the Menu bar.

2. Define a Web Project in Visual Studio.

3. What is the use of enum in C#?

4. What is a namespace in C#?

5. Define an interface in C#.

6. State the use of the Startup Object in a C# project.

7. What are breakpoints?

8. What is the use of Table Designer?

9. Write a note on WPF.

10. How you will set the properties of a control?

SECTION B — ($5 \times 5 = 25$ marks)

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

11. (a) Explain the layout of Visual Studio IDE.

Or

(b) Write a short note on Solution Explorer.

12. (a) Write a short note on class inheritance in C#.

Or

(b) Differentiate between value and reference types with examples.

13. (a) Explain how delegates and events work together in C#.

Or

(b) Write a short note on using Solution Explorer for project navigation.

14. (a) Explain the need for IntelliTrace in VB .NET.

Or

(b) Discuss the process of adding the tables in a database.

15. (a) Discuss the process of adding a data source.

Or

(b) Describe the purpose of MVC objects.

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

Answer any THREE questions.

16. Discuss the steps and components involved in creating a Visual Studio project.

17. Explain the concept of branching and looping with example program in C#.

18. Illustrate how Class Designer and Class View are used in visual Studio to understand and manage project architecture.

19. Describe the usage of stored procedure with the help of an example.

20. Create an application in Silverlight project.

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D–8498

Sub. Code
31531

DISTANCE EDUCATION

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

Third Semester

SOFTWARE ENGINEERING

(CBCS 2020 – 2021 Academic Year Onwards)

Time : Three hours Maximum : 75 marks

PART A — ($10 \times 2 = 20$ marks)

Answer ALL the questions.

1. What is software package?

2. State the main feature of boot strap.

3. Define the term spiral model.

4. Mention the feature of class modeling.

5. Give a note on modularity.

6. What is internal consistency?

7. What do you mean by beta testing?

8. Define the term white box testing.

9. Write short notes on risk management.

10. Define the term software quality.

PART B — ($5 \times 5 = 25$ marks)

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

11. (a) Explain the iterative enhancement model.

Or

(b) Discuss in detail about software process characteristics.

12. (a) Describe the various types of nonfunctional requirement.

Or

(b) Explain the various types of feasibility.

13. (a) Brief on the concept of coupling.

Or

(b) Explain the concept of cohesion.

14. (a) Describe the main difference between metrics and measures of software testing.

Or

(b) Illustrate the concept of integration and regression testing.

15. (a) Discuss in detail about software quality assurance.

Or

(b) Explain the term software reliability.

PART C — ($3 \times 10 = 30$ marks)

Answer any THREE questions.

16. Describe the concept of water fall model for software development.

17. Explain the various levels of DFD with suitable example.

18. Discuss the various principles of software design.

19. Explain the various types of software testing strategies.

20. List out the three functions of risk control. Explain in detail.

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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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D–8499

Sub. Code
31533

DISTANCE EDUCATION

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

Third Semester

INTERNET AND JAVA PROGRAMMING

(CBCS 2020 – 2021 Academic Year Onwards)

Time : Three hours Maximum : 75 marks

PART A — ($10 \times 2 = 20$ marks)

Answer ALL the questions.

1. What is the history of internet?

2. What is the use of search engine?

3. Define : Type casting.

4. Write the structure of java program.

5. What is meant by a final variable?

6. How to initialize a two dimensional array?

7. Differentiate between error and exception.

8. What are the attributes used for drawing a line in applet?

9. Define : available( ) method.

10. Differentiate between print( ) and println( ) methods.

PART B — ($5 \times 5 = 25$ marks)

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

11. (a) Discuss about FTP.

Or

(b) Explain about domain name system (DNS).

12. (a) Write a Java program to find biggest of three numbers.

Or

(b) Illustrate switch statement with an example program.

13. (a) Elaborate on interface in java.

Or

(b) Write in detail about single dimensional array.

14. (a) Describe applet life cycle.

Or

(b) Explain user defined exception.

15. (a) How to read a character from a file? Explain with code.

Or

(b) What are the byte stream classes available in java? Discuss.

PART C — ($3 \times 10 = 30$ marks)

Answer any THREE questions.

16. How to make conferencing on the internet? Explain the steps involved.

17. Compare the difference between entry control and exit control loop with suitable examples.

18. What are the ways to create package in java? Discuss the accessibility of packages.

19. Explain the procedure of drawing barcharts in applet.

20. Illustrate java writer class with an example.

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D–8500

Sub. Code
31534

DISTANCE EDUCATION

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

Third Semester

COMPUTER NETWORKS

(CBCS 2020 – 2021 Academic Year Onwards)

Time : Three hours Maximum : 75 marks

PART A — ($10 \times 2 = 20$ marks)

Answer ALL the questions.

1. What do you mean by HTTP?

2. Define the term analog signal.

3. Mention the uses of token passing.

4. What is piggy backing?

5. Give a note on virtual circuit.

6. Define the term flooding.

7. Write the features of URL.

8. Write a note on remote procedure call.

9. Define the term crypt analysis.

10. What is substitution cipher?

PART B — ($5 \times 5 = 25$ marks)

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

11. (a) Explain the various types of topologies.

Or

(b) Write note on transmission modes of communication.

12. (a) Illustrate the concept of flow and error control.

Or

(b) Brief on the concept of sliding window protocol.

13. (a) Write the advantages and disadvantages of packet switching.

Or

(b) Explain the concept of Broadcast routing.

14. (a) What is UDP? Explain the features of UDP.

Or

(b) Describe the main differences between connection oriented and connection less service.

15. (a) Describe in detail about RSA algorithm.

Or

(b) Explain the concept of network security services.

PART C — ($3 \times 10 = 30$ marks)

Answer any THREE questions.

16. Discuss in detail about guided transmission media.

17. Explain the concept of simple step and wait protocol.

18. Describe the classification of dynamic routing algorithm.

19. Discuss in detail about the architecture of HTTP.

20. Explain the architecture of asymmetric key cryptography.

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D–8501

Sub. Code
31535

DISTANCE EDUCATION

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

Third Semester

DATA MINING AND WAREHOUSING

(CBCS 2020 – 2021 Academic Year Onwards)

Time : Three hours Maximum : 75 marks

PART A — ($10 \times 2 = 20$ marks)

Answer ALL the questions.

1. What are the hardware and OS used of Data warehouse?

2. Write down the forms of knowledge.

3. Define the term dynamic itemset.

4. What do you mean by association rule?

5. Define the term clustering.

6. What are the operators used in GA?

7. What is temporal mining?

8. What is knowledge mining?

9. List out the characteristics of big data.

10. What is hadoop?

PART B — ($5 \times 5 = 25$ marks)

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

11. (a) What is data warehouse schema? Explain briefly.

Or

(b) Write short notes on different forms of knowledge.

12. (a) Brief on decision tree classification.

Or

(b) What is meant by back propagation?

13. (a) Explain briefly about K-medoid algorithm.

Or

(b) What is BIRCH? Explain briefly.

14. (a) Explain about web structure mining through an example.

Or

(b) Explain about text clustering.

15. (a) Compare traditional and big data.

Or

(b) Give a brief account on physical architecture of Hadoop.

PART C — ($3 \times 10 = 30$ marks)

Answer any THREE questions.

16. Explain the KDD process in data mining.

17. Write and illustrate the working principle of pincher search algorithm.

18. Write and illustrate the working principle of CACTUS algorithm.

19. What is machine learning? Explain its types.

20. Explain in detail about Hadoop DFS and its core components.

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D–8502	Sub. Code
	31541

DISTANCE EDUCATION

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

Fourth Semester

Computer Applications

INTERNET OF THINGS (IoT)

(CBCS 2020 – 2021 Academic Year Onwards)

Time : Three hours Maximum : 75 marks

PART A — (10 × 2 = 20 marks)

Answer ALL the questions.

1. Define the Internet of Things (IoT).

2. What are communication APIs in IoT?

3. What is the role of SDN in IoT architecture?

4. Define IoT Design Methodology in brief.

5. What is the purpose of using Raspberry Pi in IoT projects?

6. What role does data analytics play in IoT?

7. Define Python character set.

8. State the purpose of the return statement in functions.

9. Define list slicing with an example.

10. How do you create a tuple in Python?

PART B — ($5 \times 5 = 25$ marks)

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

11. (a) Explain the main components of an IoT ecosystem.

Or

(b) Identify and explain any three domain-specific IoT applications.

12. (a) Compare and contrast IoT and M2M based on connectivity and intelligence.

Or

(b) Explain the role and functioning of RFID in IoT communication.

13. (a) Compare Arduino and Raspberry Pi as IoT platforms.

Or

(b) Explain the concept of Smart Healthcare using IoT.

14. (a) Explain the steps to install Python on a computer.

Or

(b) Describe different types of loop control statements in Python.

15. (a) Explain the use of JSON in IoT applications.

Or

(b) Explain how to create and access list elements with an example.

PART C — ($3 \times 10 = 30$ marks)

Answer any THREE questions.

16. Write a detailed note on Characteristics of IoT.

17. Describe the different types of communication modules used in IoT, with a focus on Zigbee, RFID and Wi-Fi.

18. Explain the complete flow of connecting IoT devices to the cloud and utilizing cloud storage.

19. Discuss the features of the str class with example in Python.

20. Write a detailed note on HTTPlib, urllib and smtplib with suitable examples in IoT context.

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D–8503

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31542

DISTANCE EDUCATION

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

Fourth Semester

Computer Applications

ARTIFICIAL INTELLIGENCE AND SOFT COMPUTING

(CBCS 2020 – 2021 Academic Year Onwards)

Time : Three hours Maximum : 75 marks

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

Answer ALL questions.

1. What are the main characteristics of a production system?

2. Define heuristic search and list its different types.

3. What is logic programming and in AI?

4. Define knowledge representation and explain its importance in AI.

5. List out any two characteristics of soft computing.

6. What is an Artificial Neural Network?

7. Define membership function in fuzzy logic.

8. List out any two basic properties of fuzzy sets.

9. Define the term Encoding.

10. What is meant by Cross Over?

SECTION B — (5 × 5 = 25 marks)

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

11. (a) Differentiate between problem spaces and search techniques.

Or

(b) How a constraint satisfaction approach to solve the 8-Queen's problem? Explain in detail.

12. (a) Compare and contrast predicate logic and propositional logic in AI.

Or

(b) Write a note on Forward and Backward reasoning.

13. (a) How efficient is linear separability in solving practical classification problems?

Or

(b) Describe the basic terminologies used in artificial neural networks.

14. (a) Explain various operations on fuzzy sets with example.

Or

(b) Discuss various defuzzification methods used in fuzzy logic.

15. (a) What is Genetic Algorithms? Explain various elements of GA.

Or

(b) Explain the role of Genetic Programming in evolving AI-based models.

SECTION C — (3 × 10 = 30 marks)

Answer any THREE questions.

16. Discuss various AI search algorithms for real-world applications.

17. Examine the impact of different Knowledge Representation approaches on AI systems.

18. Explain the role of neural network architectures in improving deep learning models.

19. Compare and evaluate different fuzzification methods in handling uncertainty.

20. Analyze how different encoding methods affect the performance of Genetic Algorithms.

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D–8504

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31543

DISTANCE EDUCATION

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

Fourth Semester

Computer Application

BIG DATA ANALYTICS AND R PROGRAMMING

(CBCS 2020 – 2021 Academic Year Onwards)

Time : Three hours Maximum : 75 marks

PART A — ($10 \times 2 = 20$ marks)

Answer ALL questions.

1. Classify types of big data.

2. Recall big data challenges.

3. What is MapReduce?

4. Describe the Sets problem.

5. List out NoSQL business drivers.

6. Categorize variations of NoSQL architectural patterns.

7. Why R language is essential?

8. Define functions

9. What is called vectors?

10. What is known as melting?

PART B — ($5 \times 5 = 25$ marks)

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

11. (a) Categorize various technology available for big data.

Or

(b) Illustrate Physical architecture of Hadoop.

12. (a) Comment on the similarity of documents.

Or

(b) Discuss about recommendation based on user rating.

13. (a) Write notes on NoSQL data architecture. Explain it.

Or

(b) How to manage NoSQL to big data?

14. (a) Write notes on operators in R programming. Explain it.

Or

(b) Analyze functions using R programming.

15. (a) Explain about lists in R programming.

Or

(b) Recall how to a load package to a library in R programming?

PART C — ($3 \times 10 = 30$ marks)

Answer any THREE questions.

16. Comment on Hadoop.

17. Briefly explain about algorithms using MapReduce.

18. Discuss Variations of NoSQL architectural patterns.

19. Write notes on strings in R programming with an example.

20. Recall arrays in R programming.

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D–8505

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31544

DISTANCE EDUCATION

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

Fourth Semester

Computer Applications

MOBILE APPLICATION DEVELOPMENT

(CBCS 2020 – 2021 Academic Year Onwards)

Time : Three hours Maximum : 75 marks

PART A — ($10 \times 2 = 20$ marks)

Answer ALL the questions.

1. Write short notes on operators in the mobile ecosystem.
2. Describe application frameworks.
3. What is SMS?
4. Recall utility apps.
5. Define wireframes.
6. Mention various elements of mobile design.
7. List out small computing device requirements.
8. What is called SDK?
9. Give notes on eclipse.
10. Summarize about Nokia symbian.

PART B — ($5 \times 5 = 25$ marks)

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

11. (a) Describe platforms in the mobile ecosystem.

Or

(b) Recall applications in the mobile ecosystem.

12. (a) Discuss mobile websites.

Or

(b) Comment on informative apps.

13. (a) Illustrate interpreting design in mobile.

Or

(b) Write in briefly about mobile design tools.

14. (a) Write notes on the run-time environment of J2ME.

Or

(b) Discuss J2ME wireless toolkit.

15. (a) Explain about android development environment.

Or

(b) Give brief notes on Samsung Bada.

PART C — (3 × 10 = 30 marks)

Answer any THREE questions.

16. Recall application frameworks of mobile ecosystems.

17. Briefly explain about native applications.

18. Comment on mobile design.

19. Write in briefly about MIDlet programming.

20. Explain the project frameworks of android development.

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