**S–2484**

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| 23BCE1C1 |

**B.Sc. DEGREE EXAMINATION, APRIL 2026**

**First Semester**

**Computer Science**

**PROGRAMMING IN C**

**(CBCS – 2023 onwards)**

Time : 3 Hours Maximum : 75 Marks

**Part A** (10 × 2 = 20)

Answer **all** questions.

1. How to "declare variables" in C.

2. What is meant by "overflow and underflow of data"?

3. Define "goto statement" as used in C.

4. What is the "?: operator" (ternary operator)?

5. Illustrate one-dimensional array?

6. How to initialize string variables.

7. What is meant by 'function call" in user-defined functions?

8. Define "union."

9. What is "pointer increments".

10. How to define files in C?

## Part B (5 × 5 = 25)

Answer **all** questions choosing either (a) or (b).

11. (a) Illustrate the basic structure of C program.

Or

(b) Describe the "evaluation of expressions" and the role of operator precedence.

12. (a) Explain how "decision making and branching" is implemented using if, if-else, and nested if statements.

Or

(b) Discuss the use of For Loop and While Loop including their differences.

13. (a) Write a note on Multi-Dimensional array with example.

Or

(b) Describe reading and writing strings using string handling functions.

14. (a) What are the arguments types in function? Example

Or

(b) Explain declaration of structure and operations on structure members.

15. (a) Explain how to access a variable through its pointer.

Or

(b) Illustrate command line arguments in detail with example.

## Part C

(3 × 10 = 30)

Answer any **three** questions.

16. Discuss the various operators in C with example.

17. Describe input/output operations in C with example.

18. Explain "two-dimensional arrays" and their declaration.

19. Discuss user-defined functions in C with suitable example.

20. Explain in detail about File Handling Operators in C.

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**U.G. DEGREE EXAMINATION, APRIL 2026**

**Computer Science**

**Allied – DIGITAL LOGIC FUNDAMENTALS**

**(CBCS – 2023 onwards)**

Time : 3 Hours Maximum : 75 Marks

**Part A** (10 × 2 = 20)

Answer **all** questions.

1. What is a number system?

2. Convert the decimal number of 25 to its binary equivalent.

3. Define POS in Boolean algebra.

4. What is the binary addition of $1011_2$ and $1101_2$?

5. Write the function of a multiplexer.

6. What is Parity Bit?

7. Define flip flop.

8. What is the difference between D flip-flop and T flip-flop?,

9. Define Ring Counter.

10. Illustrate RAM.

## Part B (5 × 5 = 25)

Answer **all** questions choosing either (a) or (b).

11. (a) Write short note on universal gates.

Or

(b) Convert binary number of $110101_2$ to its decimal equivalent.

12. (a) Explain the K-map (Karnaugh Map) with an example.

Or

(b) Describe the working procedure of an adder in digital circuits.

13. (a) Write short note on encoder with circuit diagram.

Or

(b) Explain the function of a demultiplexer.

14. (a) Describe the working procedure of K flip-flop.

Or

(b) Explain the types of shift registers.

15. (a) Write a short note on synchronous counters.

Or

(b) Describe the basic terminologies of memory.

## Part C

(3 × 10 = 30)

Answer any **three** questions.

16. Discuss the different types of logic gates with their truth tables.

17. Explain the laws and theorems of Boolean algebra with examples.

18. Illustrate the working principle of parity generator and parity checker.

19. Explain the working function of JK flip-flop with its truth table.

20. Describe the basic terminologies and functions of ROM.

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**B.Sc. DEGREE EXAMINATION, APRIL 2026**

**First Semester**

**Computer Science**

**FUNDAMENTALS OF INFORMATION TECHNOLOGY**

**(CBCS – 2023 onwards)**

Time : 3 Hours Maximum : 75 Marks

**Part A** (10 × 2 = 20)

Answer **all** questions.

1. List the basic elements of Computers.

2. Write down the classification of computers.

3. What is a scanner?

4. Name the types of plotters.

5. What is a flash drive?

6. Bring out the uses of magnetic tapes.

7. What are the types of software?

8. Write down the advantages of high level languages.

9. Define interpreter.

10. What is time sharing in an operating system?

## Part B (5 × 5 = 25)

Answer **all** questions choosing either (a) or (b).

11. (a) Discuss in brief about the generations of computers.

Or

(b) List out the applications of computers.

12. (a) Discuss in brief about the importance and working of sound cards and speakers.

Or

(b) Bring out the applications and challenges of voice recognition systems.

13. (a) Discuss in brief about any two types of primary memory and their uses.

Or

(b) Write down the function and uses of cartridge tapes and zip drives.

14. (a) Discuss in brief about the characteristics, advantages and disadvantages of machine language, assembly language, and high-level languages.

Or

(b) Illustrate about Word Processing Software.

15. (a) Differentiate between an interpreter and a compiler.

Or

(b) Discuss in brief about the process of multiprogramming and multitasking.

## Part C

(3 × 10 = 30)

Answer any **three** questions.

16. Discuss in detail about the classification of computers with block diagram.

17. Explain in detail about the types of impact and non-impact printers with a neat structure.

18. Discuss in detail about the hard disks and optical disks with a neat structure.

19. Describe in detail about the functions of an operating system.

20. Discuss in detail about the Windows operating system.

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**B.Sc. DEGREE EXAMINATION, APRIL 2026**

**First Semester**

**Computer Science**

**PROBLEM SOLVING TECHNIQUES**

**(CBCS – 2023 onwards)**

Time : 3 Hours Maximum : 75 Marks

**Part A** (10 × 2 = 20)

Answer **all** questions.

1. Define the term *software* in the context of computer systems.

2. Identify any two types of system software.

3. List the basic arithmetic operators used in programming

4. What are the two common types of program errors?

5. State the use of nested loops in programming

6. Differentiate between if and if-else selection structures

7. Mention any two uses of arrays in programming

8. What is numeric data? Give an example.

9. Identify the difference between value and reference parameters

10. Recall any two basic operations performed on sequential files.

## Part B (5 × 5 = 25)

Answer **all** questions choosing either (a) or (b).

11. (a) Describe the major characteristics and limitations of a computer system.

Or

(b) Identify the functions of input and output devices in a computing environment.

12. (a) Describe the different phases involved in the Program Development Cycle (PDC).

Or

(b) Illustrate the feature of a good algorithm.

13. (a) Explain the difference between relational and logical operators with examples.

Or

(b) Apply a counter-controlled loop to compute the sum of the first 10 natural numbers.

14. (a) Differentiate between numeric data and character-based data with examples.

Or

(b) How to apply string manipulation? Explain.

15. (a) Illustrate DFD and its types.

Or

(b) Write the steps involved in creating and reading a sequential file.

## Part C

(3 × 10 = 30)

Answer any **three** questions.

16. Explain the types of Computers with example.

17. Create a complete program design for calculating a student's grade.

18. Evaluate the effectiveness of nested loops versus simple loops in complex problem-solving with examples

19. Illustrate two dimensional arrays with example.

20. Describe the Recursion in detail with examples.

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**S–2488**

**Sub. Code**
**23BCE2C1**

**B.Sc. DEGREE EXAMINATION, APRIL 2026**

**Second Semester**

**Computer Science**

**OBJECT ORIENTED PROGRAMMING CONCEPTS USING C++**

**(CBCS – 2023 onwards)**

Time : 3 Hours Maximum : 75 Marks

**Part A** (10 × 2 = 20)

Answer **all** questions.

1. Differentiate between break and continue statements in C++.

2. Define in line function in C++.

3. Write short notes on constructor and destructor.

4. What is a bit field in a class?

5. Define inheritance.

6. Write short notes on operator overloading.

7. What is polymorphism?

8. Compare static and dynamic binding.

9. List out the uses of templates.

10. What is the difference between a binary file and a text file?

## Part B (5 × 5 = 25)

Answer **all** questions choosing either (a) or (b).

11. (a) Explain Switch-case statement with suitable example program in C++.

Or

(b) Explain function overloading with an example program.

12. (a) Discuss the purpose of static member variables and functions with suitable example program.

Or

(b) What is friend function? Why it is used? Illustrate the same with suitable example program.

13. (a) Explain briefly about Binary operator overloading with suitable example program.

Or

(b) Explain type conversion in C++ with suitable example.

14. (a) Explain the concept of Polymorphism. Differentiate between static and dynamic polymorphism.

Or

(b) Discuss about the pointers in C++ and how they are handled with the new and delete operators.

15. (a) Discuss the different file stream classes in C++ and their uses for sequential and random access operations.

Or

(b) Explain the purpose of Exception Handling in C++. Provide a simple try-catch block example.

## Part C

(3 × 10 = 30)

Answer any **three** questions.

16. Illustrate different types of looping concepts with suitable example and compare the while and do while loop in C++.

17. Design a C++ program for a student class that include the data members for name, roll number and marks with member function to get and display data.

18. Discuss the different types of inheritance supported in C++. Explain each type with an appropriate diagram with one example program.

19. Explain how virtual functions are used to achieve dynamic polymorphism with suitable example.

20. Describe in detail about strings and declaring and initializing a string with example program.

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**S–2489**

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**U.G. DEGREE EXAMINATION, APRIL 2026**

**Computer Science**

**Allied - RESOURCE MANAGEMENT TECHNIQUES**

**(CBCS – 2023 onwards)**

Time : 3 Hours Maximum : 75 Marks

**Part A** (10 × 2 = 20)

Answer **all** questions.

1. What are the main phases of Operations Research?

2. What is the basic idea behind Linear Programming?

3. What is the primary objective of the Vogel's Approximation Method?

4. What does the MODI method stand for, and what is its purpose?

5. What is the Hungarian Method used for?

6. What is an Unbalanced Assignment Problem?

7. What is a Sequencing Problem in Operations Research?

8. Define Type I Sequencing Problem.

9. What is Folkerson's rule used for in network scheduling?

10. List two common errors in network construction.

## Part B (5 × 5 = 25)

Answer **all** the questions choosing either (a) or (b).

11. (a) What are the advantages and limitations of the graphical method in solving LPP?

Or

(b) Describe the general scope of Operations Research in decision-making processes.

12. (a) Explain the mathematical formulation of a Transportation Problem with an example.

Or

(b) Describe the Least Cost or Matrix Minima Method for solving the Transportation Problem.

13. (a) Discuss the concept of maximization in the Assignment Problem and how it differs from the minimization problem.

Or

(b) Explain the Transshipment Problem and how it extends the basic Transportation Problem.

14. (a) Discuss the method for handling Type III Sequencing Problems involving n jobs and K machines.

Or

(b) How do you approach a Type IV Sequencing Problem with 2 jobs through K machines?

15. (a) Describe the basic terms used in PERT/CPM network scheduling.

Or

(b) Explain the process of numbering the events in a network diagram using Folkerson's rule.

**Part C** (3 × 10 = 30)

Answer any **three** questions.

16. Provide a detailed explanation of the phases of Operations Research with relevant examples.

17. Explain the MODI method in detail, and demonstrate how it is used to optimize a solution obtained from an initial feasible solution of a Transportation Problem.

18. Solve an Assignment Problem using the Hungarian Method, and explain each step in detail.

19. Provide a detailed explanation of how to solve a Type II Sequencing Problem involving n jobs through three machines A, B and C. Include an example to illustrate the solution.

20. Describe the rules of network construction in PERT/CPM, including an explanation of how to apply Folkerson's rule for numbering events. Provide an example to demonstrate the network construction process.

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**S–2490**

**Sub. Code**
**23BCEA3**

**U.G. DEGREE EXAMINATION, APRIL 2026**

**Computer Science**

**Allied - MARKUP AND SCRIPTING LANGUAGES**

**(CBCS – 2023 onwards)**

Time : 3 Hours Maximum : 75 Marks

**Part A** (10 × 2 = 20)

Answer **all** questions.

1. How do you add a comment in an HTML page?

2. What is the role of the <table> tag in HTML?

3. Differentiate between a list box and a combo box in HTML forms.

4. What is the function of a textbox in an HTML form?

5. Define XML and its primary use.

6. Why is CSS important for separating content and presentation?

7. What are the logical operators in JavaScript and how are they used?

8. Name two properties or methods of the JavaScript Array object.

9. Outline how the Image object is applied in web design.

10. How do you define an event handler in JavaScript?

## Part B (5 × 5 = 25)

Answer **all** questions choosing either (a) or (b).

11. (a) Describe how to create and format text using HTML tags.

Or

(b) What are web fonts and how do you integrate them in to your website? Discuss performance considerations and fallback strategies.

12. (a) Explain how HTML forms are used for data collection.

Or

(b) Classify the various HTML input types used in forms and assess their roles in Interactive web design.

13. (a) Describe external style sheets and explain why they are considered best practice in large projects.

Or

(b) Summarize the key features and benefits of XML in data representation.

14. (a) Justify the use of JavaScript security practices in web applications.

Or

(b) Write a regExp to match a valid US phone number format.

15. (a) Differentiate between inline event handlers and event listeners.

Or

(b) Discuss the advantages and disadvantages of using Ajax.

**Part C** (3 × 10 = 30)

Answer any **three** questions.

16. Illustrate how to create tables and frames using HTML.

17. Demonstrate the creation of image maps using appropriate HTML tags.

18. Evaluate CSS positioning techniques for dynamic content layouts.

19. Explain differences between client-side and server-side JavaScript with examples.

20. Outline how the document object and related object function in JavaScript.

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**S–2491**

**Sub. Code**
**23BCEA4**

**U.G. DEGREE EXAMINATION, APRIL 2026**

**Computer Science**

**Allied – OPERATING SYSTEM**

**(CBCS – 2023 onwards)**

Time : 3 Hours Maximum : 75 Marks

**Part A** (10 × 2 = 20)

Answer **all** questions.

1. Define an Operating System.

2. Differentiate between process and program.

3. What is paging?

4. State directory.

5. Define deadlock.

6. Mention the purpose of ostrich algorithm.

7. Specify the use of cat command.

8. List any two features of Linux.

9. State the purpose of the ps command.

10. Name any two text editors used in Linux.

## Part B (5 × 5 = 25)

Answer **all** questions choosing either (a) or (b).

11. (a) Describe the main components of an operating system.

Or

(b) Explain about the system calls with suitable examples.

12. (a) Write about the segmentation with advantages.

Or

(b) Discuss file system implementation techniques.

13. (a) Illustrate about the four necessary deadlock conditions.

Or

(b) Discuss about the kernel structure of Linux.

14. (a) Explore about the basic features of the Linux operating system.

Or

(b) Illustrate the essential Linux commands and their applications.

15. (a) Write elaborately about mathematical commands in Linux.

Or

(b) Describe in detail looping statements in shell scripting.

## Part C

(3 × 10 = 30)

Answer any **three** questions.

16. Explain about interprocess communication mechanisms and problems.

17. Analyse about the design issues of paging system in detail.

18. Describe in detail about deadlock avoidance with example.

19. Illustrate the architecture of Linux system with a neat diagram.

20. Elucidate elaborately about shell programming concepts with examples.

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**S–2492**

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**B.Sc. DEGREE EXAMINATION, APRIL 2026**

**Second Semester**

**Computer Science**

**OFFICE AUTOMATION**

**(CBCS – 2023 onwards)**

Time : 3 Hours Maximum : 75 Marks

**Part A** (10 × 2 = 20)

Answer **all** questions.

1. How to insert Bullets into the Word Document?

2. What are the two ways to save the document?

3. Illustrate Paragraph alignment.

4. Define Indentation.

5. How to insert charts in Excel?

6. Write the procedure to format the cells in Excel.

7. Define Query.

8. Illustrate about Database.

9. How to perform slide transition?

10. What is the purpose of timer in PowerPoint?

## Part B (5 × 5 = 25)

Answer **all** questions choosing either (a) or (b).

11. (a) Write short note on text Editing in word.

Or

(b) Describe the tools that are used in MS word.

12. (a) Compare Header and Footer.

Or

(b) Describe Print and Print preview in detail.

13. (a) Discuss the formulas available in Excel.

Or

(b) Write the procedure to create chart in excel.

14. (a) How to search records in Access? Explain

Or

(b) Compare Sorting and Filtering Data.

15. (a) Discuss the features of Powerpoint.

Or

(b) Describe how to include objects and pictures in ppt?

## Part C

(3 × 10 = 30)

Answer any **three** questions.

16. Discuss about formatting features in MS Word with examples.

17. Describe the Merge Options in MS-Word.

18. Illustrate how to navigate data to multiple sheets in MS excel.

19. How to design Queries in Access? Explain

20. Describe various Power point Animation Effects with examples.

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**S–2493**

**Sub. Code**
**23BCE2S2**

**B.Sc. DEGREE EXAMINATION, APRIL 2026**

**Second Semester**

**Computer Science**

**INTRODUCTION TO HTML**

**(CBCS – 2023 onwards)**

Time : 3 Hours Maximum : 75 Marks

**Part A** (10 × 2 = 20)

Answer **all** questions.

1. Define HTML.

2. What is a web browser?

3. Write the HTML tag for headings.

4. List two font style elements in HTML.

5. Define nested lists.

6. Write the html tag for scrolling text.

7. Write the HTML tag for creating a table row.

8. Differentiate between frameset and no frame.

9. Define the <select> tag in HTML.

10. What is the purpose of the <label> tag?

## Part B (5 × 5 = 25)

Answer **all** questions, choosing either (a) or (b).

11. (a) Explain the structure of a basic HTML document with example.

Or

(b) Illustrate how tags are used in HTML with examples.

12. (a) Demonstrate the use of bold, italic, and underline tags with HTML code.

Or

(b) Compare block-level and inline elements with examples.

13. (a) Write HTML code to create a nested list.

Or

(b) Illustrate how to create hyperlinks in lists.

14. (a) Write HTML code to create a simple student marks table.

Or

(b) Demonstrate the use of caption tag in tables.

15. (a) Demonstrate the use of <textarea> with an example.

Or

(b) Explain the difference between radio buttons and checkboxes.

## Part C

(3 × 10 = 30)

Answer any **three** questions.

16. Explain in detail the working of the Internet and Web with diagrams.

17. Create an HTML document demonstrating headings, paragraphs, and font styles.

18. Design a webpage that demonstrates ordered, unordered, and nested lists with hyperlinks

19. Create a timetable in HTML using table, caption, colspan, and rowspan.

20. Design a registration form with input fields, select options, and submit button.

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**S–2494**

**Sub. Code**
**23BCE3C1**

**B.Sc. DEGREE EXAMINATION, APRIL 2026**

**Third Semester**

**Computer Science**

**DATA STRUCTURE AND ALGORITHMS**

**(CBCS – 2023 onwards)**

Time : 3 Hours Maximum : 75 Marks

**Part A** (10 × 2 = 20)

Answer **all** questions.

1. Define Abstract Data Type (ADT).

2. What is Asymptotic Notation?

3. Define Singly Linked List.

4. What is a Circular Doubly Linked List?

5. Write the array representation of a Stack.

6. List any two Applications of Queues.

7. What is a Binary Search Tree?

8. Define AVL Trees.

9. What is Linear Search?

10. List any two Sorting Algorithms.

## Part B (5 × 5 = 25)

Answer **all** questions, choosing either (a) or (b).

11. (a) Explain the Time and Space Complexity of algorithms.

Or

(b) Write a note on Sparse Matrices and their Applications.

12. (a) Differentiate between Singly Linked List and Doubly Linked List.

Or

(b) Explain the Applications of Linked Lists with examples.

13. (a) Explain Operations on a Linked Stack.

Or

(b) Differentiate between Array Representation and Linked Representation of Queues.

14. (a) Explain Huffman's Tree and its Applications.

Or

(b) Write short notes on Threaded Binary Trees.

15. (a) Explain Bubble Sort and Selection Sort with examples.

Or

(b) Write short notes on External Sorting.

## Part C

(3 × 10 = 30)

Answer any **three** questions.

16. Describe the Classification of Data Structures. Discuss Operations on Data Structures with examples.

17. Explain in detail Circular Linked Lists and their Applications.

18. Describe in detail the Operations on Stack and its Types.

19. Explain AVL Trees in detail. Discuss it Applications.

20. Compare various Sorting Algorithms with Time Complexity and Performance.

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**S–2495**

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**B.Sc. DEGREE EXAMINATION, APRIL 2026**

**Third Semester**

**Computer Science**

**WEB DESIGNING**

**(CBCS – 2023 onwards)**

Time : 3 Hours Maximum : 75 Marks

**Part A** (10 × 2 = 20)

Answer **all** questions.

1. What is XML?

2. List out the uses of CSS.

3. Define Navigation Bar.

4. Write the syntax of Text Format.

5. Illustrate HTML.

6. What is Event bubbling?

7. Write the concept of If statement with example.

8. What is Repetition?

9. How to define Java script object?

10. State the use of 'new' keyword.

## Part B (5 × 5 = 25)

Answer **all** questions, choosing either (a) or (b).

11. (a) Difference between HTML and DHTML.

Or

(b) Write the simple HTML program with adding CSS.

12. (a) Describe working principles of block elements and objects.

Or

(b) How to create the page layout in PHP?.

13. (a) Explain about DCOM in detail.

Or

(b) Discuss about the Data binding.

14. (a) Explain about client- server scripting.

Or

(b) Write simple Java script program.

15. (a) Describe about Web browser environments.

Or

(b) Write notes on Object properties In Java script.

## Part C (3 × 10 = 30)

Answer any **three** questions.

16. Describe in detail about XML.

17. Discuss about the properties of CSS.

18. Describe the Accessing of HTML & CSS tags through DCOM with example.

19. Explain about control statements of Java script.

20. Discuss in detail about forms and validations in Java script.

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**S–2496**

| Sub. Code |
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| 23BCE3S2 |

**B.Sc. DEGREE EXAMINATION, APRIL 2026**

**Third Semester**

**Computer Science**

**MULTIMEDIA SYSTEMS**

**(CBCS – 2023 onwards)**

Time : 3 Hours Maximum : 75 Marks

**Part A** (10 × 2 = 20)

Answer **all** questions.

1. Define multimedia.

2. What is the purpose of font editing tools in multimedia

3. Name any two commonly used image formats.

4. What is MIDI audio?

5. Define digital audio and explain its significance in multimedia.

6. List two ways to add sound to a multimedia project.

7. Define Animation.

8. What is meant by the power of motion in multimedia.

9. What are intangible needs in a multimedia project?

10. Name two types of hardware needed for multimedia production.

## Part B (5 × 5 = 25)

Answer **all** questions, choosing either (a) or (b).

11. (a) Illustrate the use of multimedia in education.

Or

(b) Describe the role of hypermedia in multimedia systems.

12. (a) List down the advantages of using MIDI audio over digital audio?

Or

(b) Describe the process of making still images.

13. (a) Compare different audio file formats used in multimedia.

Or

(b) Describe Vaughan's Law of Multimedia Minimums and its application in sound design.

14. (a) Describe the workflow for shooting and editing video for multimedia projects.

Or

(b) Illustrate the steps involved in making animations that work effectively in multimedia.

15. (a) Explain the different stages involved in a multimedia project.

Or

(b) Describe the essential software needs in multimedia production.

## Part C

(3 × 10 = 30)

Answer any **three** questions.

16. How are text font editing and design tools utilized to enhance the effectiveness of multimedia content? Explain.

17. Explain the power of sound in multimedia and its various forms.

18. Evaluate the role of digital audio in enhancing multimedia projects.

19. What are the principles of animation? How does computer animation make multimedia better?

20. Discuss the structure and roles of a multimedia production team, How does teamwork impact the success of a multimedia project?

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**S–2497**

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**B.Sc. DEGREE EXAMINATION, APRIL 2026**

**Fourth Semester**

**Computer Science**

**JAVA PROGRAMMING**

**(CBCS – 2023 onwards)**

Time : 3 Hours Maximum : 75 Marks

**Part A** (10 × 2 = 20)

Answer **all** questions.

1. What is constructor?

2. List out the features of Object Oriented Concept.

3. Define Abstract classes.

4. Write the syntax of Runnable Interface.

5. What is Dead jock?

6. Write the concept of stream.

7. List out the AWT controls.

8. What is Inner class?

9. Draw the Hierarchy of swing components.

10. Define JPanel.

## Part B (5 × 5 = 25)

Answer **all** questions choosing either (a) or (b).

11. (a) Explain about control statements in Java.

Or

(b) Illustrate the simple java program.

12. (a) What is Inheritance and describe its types?

Or

(b) Differentiate Method Overloading and Method Overriding.

13. (a) Explain about synchronized methods in detail.

Or

(b) What is I/O streams? and discuss the concepts of streams.

14. (a) How to work with the Panels.

Or

(b) Discuss about the Adapter classes.

15. (a) What is containers? and draw the Top level container.

Or

(b) Write the syntax of JToggleButton with example.

## Part C

(3 × 10 = 30)

Answer any **three** questions.

16. Explain in detail about the JVM architecture.

17. What is Interfaces and describe the extending interfaces.

18. Explain about Multithreaded Programming with example

19. Discuss in detail about Event Delegation Model.

20. What is Swing? and Discuss about swing components?

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**S–2498**

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**B.Sc. DEGREE EXAMINATION, APRIL 2026**

**Fourth Semester**

**Computer Science**

**PHP PROGRAMMING**

**(CBCS – 2023 onwards)**

Time : 3 Hours Maximum : 75 Marks

**Part A** (10 × 2 = 20)

Answer **all** questions.

1. What is PHP?

2. List out the websites uses PHP.

3. Write the syntax for Ternary operators in PHP.

4. What is scalar data type?

5. How to create the own functions in PHP?

6. State the use of continue and Break statements.

7. Define File handling.

8. Write the modes to open a file.

9. What is session?

10. How to modify a cookie?

## Part B (5 × 5 = 25)

Answer **all** questions choosing either (a) or (b).

11. (a) What are the steps involved in creating a first PHP script?

Or

(b) Compare the XAMPP and WAMP.

12. (a) Explain about Conditional Statements in PHP.

Or

(b) How to embedding PHP in HTML?

13. (a) How do you access elements in an array in PHP?

Or

(b) Write the syntax of While loop in PHP with example.

14. (a) Explain reading and writing the binary data in a file.

Or

(b) Discuss the PHP file directory functions.

15. (a) How to start a session in PHP?

Or

(b) Write the PHP program to demonstrate the use of cookies.

## Part C

(3 × 10 = 30)

Answer any **three** questions.

16. How to make Dynamic website using PHP in detail?

17. Describe various types of operators in PHP.

18. Discuss various array functions in PHP with example.

19. Describe freado, fgets() and fgetc() function in file handling.

20. How to store data in cookies? Explain.

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**S–2499**

| Sub. Code |
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| 23BCE4S2 |

**B.Sc. DEGREE EXAMINATION, APRIL 2026**

**Fourth Semester**

**Computer Science**

**SOFTWARE TESTING**

**(CBCS – 2023 onwards)**

Time : 3 Hours Maximum : 75 Marks

**Part A** (10 × 2 = 20)

Answer **all** questions.

1. Define software testing.

2. How does design style influence testing techniques?

3. Mention any two applications of transaction flow testing.

4. Differentiate between node and edge in a flow graph.

5. What is data flow testing?

6. What are the two key elements of domain testing?

7. State the role of linguistics in software testing.

8. How does input format support syntax test case design?

9. What is transition testing?

10. Differentiate between a state and a transition in state testing.

## Part B (5 × 5 = 25)

Answer **all** questions choosing either (a) or (b).

11. (a) Explain the purpose of software testing in quality assurance.

Or

(b) Justify structured testing over ad-hoc methods.

12. (a) Summarize the concept of flow graphs in software testing.

Or

(b) Describe the steps involved in Application Transaction Flow testing.

13. (a) Compare data flow testing and control flow testing.

Or

(b) Evaluate interface testing strategies for inter-module communication.

14. (a) Describe the significance of metrics in syntax-based testing.

Or

(b) Analyze the role of path expressions in flow-based testing.

15. (a) Illustrate state testing using a state graph diagram.

Or

(b) Evaluate the usefulness of decision tables for test case generation.

## Part C

(3 × 10 = 30)

Answer any **three** questions.

16. Explain how software testing improves productivity and ensures product quality.

17. Compare basic path testing and transaction flow testing techniques.

18. Explain domains and paths involved in domain testing techniques.

19. Describe structural metrics and their use in software quality assessment.

20. Compare decision table testing and transition testing techniques.

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**S–2500**

| Sub. Code |
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| 23BCE5C1 |

**B.Sc. DEGREE EXAMINATION, APRIL 2026**

**Fifth Semester**

**Computer Science**

**OPERATING SYSTEMS**

**(CBCS – 2023 onwards)**

Time : 3 Hours Maximum : 75 Marks

**Part A** (10 × 2 = 20)

Answer **all** questions.

1. What is Operating system?
2. Draw the PCB model.
3. Define Thread.
4. What is semaphores?
5. Write about circular wait condition.
6. What is deadlock recovery?
7. Define Non-Preemptive scheduling.
8. List out the disk scheduling algorithns.
9. Define Memory management.
10. What is Virtual memory.

## Part B (5 × 5 = 25)

Answer **all** questions, choosing either (a) or (b).

11. (a) Discuss about Process state transitions.

Or

(b) Explain about Distributed computing.

12. (a) Discuss about Lamports Bakery algorithm.

Or

(b) Describe the Mutual exclusion primitives.

13. (a) Write the algorithm of deadlock detection.

Or

(b) Discuss about the Deadlock prevention.

14. (a) Describe about Round robin scheduling with example.

Or

(b) Explain about Fair share scheduling.

15. (a) Discuss about Fixed partition multiprogramming.

Or

(b) Describe about Segmentation with example.

## Part C (3 × 10 = 30)

Answer any **three** questions.

16. Discuss about Inter process communication.

17. Explain in detail about Concurrent programming

18. Explain the deadlock avoidance algorithm with suitable example.

19. What is processor scheduling? and discuss about scheduling objectives.

20. Explain in Memory Hierarchy in detail.

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**S–2501**

| Sub. Code |
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| 23BCE5C2 |

**B.Sc. DEGREE EXAMINATION, APRIL 2026**

**Fifth Semester**

**Computer Science**

**DATABASE MANAGEMENT SYSTEM**

**(CBCS – 2023 onwards)**

Time : 3 Hours Maximum : 75 Marks

**Part A** (10 × 2 = 20)

Answer **all** questions.

1. Differentiate between file system and database system.

2. Define data abstraction.

3. What is a primary key? Give an example.

4. Define the term “data redundancy.”

5. What is the purpose of normalization?

6. Write about Data Manipulation Commands.

7. Differentiate between INNER JOIN and OUTER JOIN.

8. What is the difference between WHERE and HAVING clauses in SQL?

9. Define PL/SQL block structure.

10. List any two types of cursors in PL/SQL.

## Part B

(5 × 5 = 25)

Answer **all** questions, choosing either (a) or (b).

11. (a) Explain the importance of business rules in database design.

Or

(b) Discuss degrees of data abstraction with neat sketches.

12. (a) Explain the concept of an Entity Relationship (ER) diagram with an example.

Or

(b) Write short notes on relational integrity rules.

13. (a) Explain 1 NF in detail with suitable examples.

Or

(b) Differentiate between DDL and DCL commands in SQL with examples.

14. (a) Explain UNION, INTERSECT, and MINUS set operators with examples.

Or

(b) Write short notes on SQL numeric and string functions with examples.

15. (a) Write a PL/SQL program to calculate factorial of a number using control structures.

Or

(b) Explain exception handling in PL/SQL with examples.

## Part C

(3 × 10 = 30)

Answer any **three** questions.

16. Discuss the advantages of DBMS over traditional file systems. Explain with real-world examples.

17. Construct an ER diagram for an Online Bookstore Management System and explain entities, attributes, and relationships.

18. Illustrate BCNF in detail with example.

19. Discuss in detail about subqueries and correlated queries in SQL with suitable examples.

20. Explain in detail the concepts of cursors in PL/SQL with example.

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**S–2502**

| Sub. Code |
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| 23BCE5C3 |

**B.Sc. DEGREE EXAMINATION, APRIL 2026**

**Fifth Semester**

**Computer Science**

**SOFTWARE ENGINEERING**

**(CBCS – 2023 onwards)**

Time : 3 Hours Maximum : 75 Marks

**Part A** (10 × 2 = 20)

Answer **all** questions.

1. Differentiate between a program and a software product.

2. State one advantage of the prototyping model.

3. Illustrate Function-Oriented Design.

4. What is meant by software requirements?

5. Name any two types of DFDs.

6. What is Graphical User Interface?

7. Mention the purpose of debugging.

8. Give the concept of software quality.

9. Analyze the role of a central repository in maintaining consistency across CASE tools.

10. What is software reverse engineering?

## Part B (5 × 5 = 25)

Answer **all** questions, choosing either (a) or (b).

11. (a) Discuss the need for studying software engineering. How does it help in developing reliable and maintainable software systems?

Or

(b) Illustrate the spiral model with the help of a diagram.

12. (a) Describe the steps involved in software requirements analysis.

Or

(b) Illustrate the approaches of Software Design.

13. (a) Explain the main steps of the SA/SD methodology.

Or

(b) Examine the rules and guidelines for DFD construction.

14. (a) Define software reliability and explain why it is important.

Or

(b) Elaborate on integration testing and system testing.

15. (a) Compare various software maintenance process models.

Or

(b) Illustrate about CASE and its Scope.

## Part C

(3 × 10 = 30)

Answer any **three** questions.

16. Illustrate the Comparison of different Life Cycle Models.

17. Demonstrate in detail about Software Requirement Specification.

18. Describe about type of user interface and its methodology.

19. Illustrate about SEI capability maturity model in detail.

20. Describe the Characteristics of Software Maintenance in detail

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**S–2503**

| Sub. Code |
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| 23BCE5E1 |

**B.Sc. DEGREE EXAMINATION, APRIL 2026**

**Fifth Semester**

**Computer Science**

**Elective – ARTIFICIAL INTELLIGENCE**

**(CBCS – 2023 onwards)**

Time : 3 Hours Maximum : 75 Marks

**Part A** (10 × 2 = 20)

Answer **all** questions.

1. What is meant by an intelligent agent?

2. Name any two real-world applications of AI.

3. Define open list and closed list in search algorithms.

4. How does heuristic search improve efficiency?

5. State Bayes' rule.

6. Define Hidden Markov Model.

7. What is utility theory?

8. List the elements of an MDP formulation.

9. Differentiate between passive and active reinforcement learning.

10. What is Qlearning?

## Part B (5 × 5 = 25)

Answer **all** questions choosing either (a) or (b).

11. (a) Describe the concept of Artificial Intelligence and its evolution.

Or

(b) Analyze the differences between search graph and search tree.

12. (a) Explain depth-first search and breadth-first search algorithms.

Or

(b) Outline the role of game search in Artificial Intelligence.

13. (a) Describe Bayes' rule and its significance in reasoning under uncertainty.

Or

(b) Explain temporal models used in probabilistic reasoning.

14. (a) Illustrate the value iteration algorithm with an example.

Or

(b) Discuss the importance of Markov Decision Processes in sequential decision-making problems.

15. (a) Explain passive reinforcement learning with suitable examples.

Or

(b) Illustrate the Q-learning algorithm and its working principle.

## Part C

(3 × 10 = 30)

Answer any **three** questions.

16. Discuss the current status and future scope of Artificial Intelligence.

17. Illustrate the A* algorithm with an example.

18. Summarize the components and its features of Hidden Markov Models.

19. Describe utility theory and its relevance in decision making.

20. Explain the adaptive dynamic programming with an example.

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**S–2505**

| Sub. Code |
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| 23BCE5E3 |

**B.Sc. DEGREE EXAMINATION, APRIL 2026.**

**Fifth Semester**

**Computer Science**

**Elective – INTRODUCTION TO DATA SCIENCE**

**(CBCS – 2023 onwards)**

Time : 3 Hours Maximum : 75 Marks

**Part A** (10 × 2 = 20)

Answer **all** the questions.

1. Define Data Science.
2. State any two uses of Data Science.
3. What is data transformation?
4. Define Exploratory Data Analysis (EDA).
5. What is supervised learning?
6. Write the features of unsupervised learning.
7. What is Hadoop?
8. Define NOSQL database.
9. What is disease prediction?
10. Write short note on data profiling.

## Part B (5 × 5 = 25)

Answer **all** questions. Choosing either (a) or (b).

11. (a) Explain the benefits and uses of Data Science.

Or

(b) Describe about Data Science Process.

12. (a) Illustrate the steps involved in the Data Science process.

Or

(b) Describe in detail about data retrieval and transformation techniques.

13. (a) Explain how machine learning algorithms used in data science.

Or

(b) Compare supervised, unsupervised and semi-supervised learning.

14. (a) Illustrate the framework of Hadoop in detail.

Or

(b) Describe about ACID and BASE properties.

15. (a) Explain in detail about disease data preparation techniques.

Or

(b) Describe disease profiling in data science applications.

## Part C

(3 × 10 = 30)

Answer any **three** questions.

16. Illustrate the ecosystem of Big Data and its role in Data Science.

17. Explain in detail about EDA with neat sketch.

18. Describe semi-supervised learning with suitable examples.

19. Compare Hadoop, Spark, and the replacement of MapReduce.

20. Explain the complete workflow of disease prediction using Data Science.

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**S–2506**

| Sub. Code |
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| 23BCE5E4 |

**B.Sc. DEGREE EXAMINATION, APRIL 2026.**

**Fifth Semester**

**Computer Science**

**Elective – BIG DATA ANALYTICS**

**(CBCS – 2023 onwards)**

Time : 3 Hours Maximum : 75 Marks

**Part A** (10 × 2 = 20)

Answer **all** the questions.

1. Differentiate between traditional data analytics and Big Data analytics.

2. Name the components of the Hadoop ecosystem.

3. Define clustering in data analysis.

4. Outline the general algorithm steps for building a decision tree.

5. List two steps in evaluating candidate association rules.

6. State one advantage of using collaborative recommendations.

7. Explain the purpose of sampling data in streams.

8. Discuss an application of RTAP in real-time analytics.

9. Name two big data applications in e-commerce.

10. Summarize basic data analytic methods using R.

## Part B (5 × 5 = 25)

Answer **all** questions. Choosing either (a) or (b).

11. (a) Differentiate structured and unstructured data in Big Data.

Or

(b) Demonstrate real-world Big Data use cases with examples.

12. (a) Justify the choice of K-means for customer segmentation.

Or

(b) Summarize the general algorithm for building a decision tree.

13. (a) Define association rules in data mining with suitable examples.

Or

(b) Compare collaborative and content-based recommendation systems.

14. (a) Explain sampling techniques used in stream data processing.

Or

(b) Evaluate the effectiveness of real-time sentiment analysis systems.

15. (a) Explain the role of NOSQL databases in big data analytics.

Or

(b) Discuss the applications of HBase in big data analytics.

**Part C** (3 × 10 = 30)

Answer any **three** questions.

16. Describe best practices for implementing effective big data analytics in organizations.

17. Illustrate common diagnostics used to evaluate clustering results in K-means.

18. How to Find Association and Similarities? Explain

19. Discuss the benefits of Real-Time Analytics Platforms (RTAP) using case studies.

20. Differentiate graph databases from object data stores with examples.

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**S–2507**

| Sub. Code |
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| 23BCE6C1 |

**B.Sc. DEGREE EXAMINATION, APRIL 2026**

**Sixth Semester**

**Computer Science**

**COMPUTER NETWORKS**

**(CBCS – 2023 onwards)**

Time : 3 Hours Maximum : 75 Marks

**Part A** (10 × 2 = 20)

Answer **all** questions.

1. Define Software.

2. What is ATM?

3. Define communication satellite.

4. What is the function of the data link layer?

5. What is piggybacking in sliding window protocol?

6. What are multiple access protocols?

7. Define congestion in a network.

8. What are routing algorithms?

9. What is addressing in the transport layer?

10. What is symmetric key cryptography?

## Part B (5 × 5 = 25)

Answer **all** questions, choosing either (a) or (b).

11. (a) Discuss in brief about the components of network hardware and software with a neat structure.

Or

(b) Write short notes on Guided transmission media.

12. (a) Explain in brief about the design issues of data link layer.

Or

(b) Discuss in brief about Frequency division multiplexing with a neat structure.

13. (a) Write short notes on channel allocation problem.

Or

(b) Discuss in brief about the working procedure of Bluetooth.

14. (a) What are the different types of routing algorithms? Explain any one.

Or

(b) Write short notes on Internet Protocol.

15. (a) Discuss in brief about the services provided by the transport layer.

Or

(b) What is cryptography? Explain in brief about asymmetric cryptography.

## Part C (3 × 10 = 30)

Answer any **three** questions.

16. Illustrate OSI reference model in detail.

17. Describe in detail about various types of wireless transmission methods with a neat structure.

18. Elaborate in detail about error detection techniques and its types with a neat structure.

19. Describe in detail about the structure of Congestion control algorithms.

20. Discuss in detail about the process of establishing and releasing a connection in transport layer.

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| S–2508 | Sub. Code 23BCE6E1 |
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**B.Sc. DEGREE EXAMINATION, APRIL 2026**

**Sixth Semester**

**Computer Science**

**Elective – .NET PROGRAMMING**

**(CBCS – 2023 onwards)**

Time : 3 Hours Maximum : 75 Marks

**Part A** (10 × 2 = 20)

Answer **all** questions.

1. What is the role of the Common Language Runtime (CLR) in the .NET Framework?

2. List any two primitive data types in C#.

3. Mention any two standard web form controls in ASP.NET.

4. Define a List control in ASP.NET.

5. Mention two properties of the File Upload control.

6. Which C# class is commonly used for reading from and writing to text files?

7. What is the use of a Data Adapter in ADO.NET?

8. Name any two classes used to establish a database connection in ADO.NET.

9. List any two properties of the Grid View control used for sorting.

10. Which namespace is commonly used for working with XML files in C#?

## Part B (5 × 5 = 25)

Answer **all** questions, choosing either (a) or (b).

11. (a) Describe the various types of looping constructs available in C#. Provide syntax examples.

Or

(b) Discuss the importance and usage of the Framework Class Library (FCL) in the NET ecosystem.

12. (a) List and explain the key properties and events of the TextBox control in ASP.NET.

Or

(b) Briefly explain the components of the ASP.NET framework.

13. (a) Describe the various rich controls in ASP.NET with their key properties and event-handling mechanisms.

Or

(b) What are different File share modes in C#? Explain their significance.

14. (a) Differentiate between connected and disconnected data access in ADO.NET.

Or

(b) Describe the properties and methods of the Sql Command object with examples.

15. (a) Elaborate how the Xml Reader and Xml Writer classes are used to manipulate XML data.

Or

(b) Differentiate between authentication and authorization with examples.

**Part C** (3 × 10 = 30)

Answer any **three** questions.

16. Discuss the concept of object-oriented programming in C# and how it is implemented in .NET.

17. Compare HTML controls and Web Form controls in ASP.NET.

18. Explain the role of validation controls in ASP.NET.

19. Develop an ASP.NET application that retrieves data from a SQL Server database using DataAdapter and displays it in a Grid View.

20. Create a web form to display and update user details from an XML file.

**S–2509**

| Sub. Code |
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| 23BCE6E2 |

**B.Sc. DEGREE EXAMINATION, APRIL 2026**

**Sixth Semester**

**Computer Science**

**Elective – PYTHON PROGRAMMING**

**(CBCS – 2023 onwards)**

Time : 3 Hours Maximum : 75 Marks

**Part A** (10 × 2 = 20)

Answer **all** questions.

1. Mention any two features of Python.

2. Define keywords in python with example.

3. What is the purpose of the pass statement?

4. Write down the syntax for while loop.

5. Define a function.

6. What are called modules?

7. Define List.

8. What are called tuples?

9. Define file.

10. Write down the syntax for append() method.

## Part B (5 × 5 = 25)

Answer **all** questions choosing either (a) or (b).

11. (a) Write short notes on type conversions in python with an example.

Or

(b) Discuss in brief about the importance of indentation in Python.

12. (a) Explain in brief about branching statements with examples.

Or

(b) Discuss in brief about the break and continue statement with an example.

13. (a) Explain in brief about the scope and lifetime of variables with an example.

Or

(b) Write short notes on dir() function with an example.

14. (a) Discuss in brief about the basic list operations with example.

Or

(b) How do you update an delete elements in a tuple? Explain with an example.

15. (a) Write short notes on the types of files in python.

Or

(b) Explain in brief about the process of renaming and deleting files.

## Part C

(3 × 10 = 30)

Answer any **three** questions.

16. Describe in detail about different types of operators and expressions in Python with suitable examples.

17. Explain in detail about iterative statements in python with an example.

18. Discuss in detail about modules and namespaces with suitable example.

19. Elaborate in detail about the process of creating, accessing, updating and deleting elements in a dictionary.

20. Explain the following with examples (a) reading a file, (b) Writing a file.

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**S–2510**

**Sub. Code**
**23BCE6E3**

**B.Sc. DEGREE EXAMINATION, APRIL 2026**

**Sixth Semester**

**Computer Science**

**Elective – COMPUTER GRAPHICS**

**(CBCS – 2023 onwards)**

Time : 3 Hours Maximum : 75 Marks

**Part A** (10 × 2 = 20)

Answer **all** questions.

1. Define computer-aided design (CAD).

2. What is the difference between presentation graphics and computer art?

3. Define a pixel.

4. Compare Color and Grayscale Level.

5. What is antialiasing in computer graphics? -

6. Elaborate area-fill attributes.

7. Define shear transformation.

8. What is meant by composite transformation in 2D graphics?

9. Define clipping.

10. What is the purpose of a viewport transformation?

## Part B (5 × 5 = 25)

Answer **all** questions choosing either (a) or (b).

11. (a) Explain the role of graphical user interfaces (GUIs) in computer graphics.

Or

(b) Discuss the applications of computer graphics in education and entertainment.

12. (a) Explain the midpoint line drawing algorithm with an example.

Or

(b) Write a note on polygon filling techniques.

13. (a) Discuss curve attributes in detail.

Or

(b) Explain bundled and inquiry functions with suitable examples.

14. (a) Derive the matrix for 2D rotation transformation.

Or

(b) Explain reflection transformations about x-axis, y-axis, and origin.

15. (a) Explain line clipping using the Cohen—Sutherland algorithm.

Or

(b) Explain text clipping with an example.

## Part C

(3 × 10 = 30)

Answer any **three** questions.

16. Describe the architecture of a raster scan display system.

17. Explain in detail the algorithms for circle generation.

18. Discuss the attributes of output primitives with example.

19. With suitable examples, explain translation, scaling, and rotation in 2D geometric transformations.

20. Discuss in detail about the two-dimensional viewing pipeline and various clipping Operations.

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**S–2511**

**Sub. Code**
**23BCE6E4**

**B.Sc. DEGREE EXAMINATION, APRIL 2026**

**Sixth Semester**

**Computer Science**

**Elective – MOBILE COMPUTING**

**(CBCS – 2023 onwards)**

Time : 3 Hours Maximum : 75 Marks

**Part A** (10 × 2 = 20)

Answer **all** questions.

1. Define mobility and portability in wireless technologies.

2. What is the role of IETF in mobile networking?

3. What is GSM?

4. Define spread spectrum in cellular communication.

5. What is an agent advertisement?

6. Define home agent processing.

7. Define encapsulation in mobile IP.

8. What is Unicast?

9. What is renumbering in IPv6 mobility support?

10. Define ingress filtering.

## Part B (5 × 5 = 25)

Answer **all** questions choosing either (a) or (b).

11. (a) Explain the concept of laptop computing and its applications.

Or

(b) Write short notes on IP and routing in mobile computing.

12. (a) Explain wireless transmission and multiplexing techniques.

Or

(b) Describe handover procedure in cellular systems.

13. (a) Explain router discovery protocol.

Or

(b) Write short notes on authentication overview in mobile registration.

14. (a) Explain unicast broadcast and multicast datagram tunneling.

Or

(b) Write short notes on route optimization in mobile IP.

15. (a) Explain WAP protocol in mobile computing.

Or

(b) Describe broadcast preference extensions in mobile IP.

## Part C

(3 × 10 = 30)

Answer any **three** questions.

16. Discuss the overview of mobile networking with suitable example.

17. Illustrate the architecture of GSM.

18. Discuss in detail the mobile node registration procedures.

19. Discuss tunneling overview, routing failures, and extensions in mobile datagram management.

20. Discuss mobility support in IP version 6

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