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A-601

BCA/BCA-AIML/BCA-CTIS/BCA-DS I Semester Examinations (Dec 2025)

Foundations of Computer Science (BCA-101A)

Time- 3hrs

Max.Marks-60

Attempt 5 questions in all, selecting one question from each unit and Question 1 is compulsory. Each Question carries 12 marks.

Q.1	Marks
(a) Define computer characteristics.	2
(b) What is firmware? Give an example.	2
(c) What is a device driver?	2
(d) Write any three features of an operating system.	2
(e) Differentiate between Internet and Intranet.	2
(f) What is phishing attack?	2

**UNIT-I**

Q.2(a) Describe computer system components in detail.	6
Q.2(b) What is software? Explain different types of software with suitable examples.	6
Q.3(a) What is primary memory? Explain RAM, ROM, PROM, and EPROM.	6
Q.3(b) Discuss any three secondary storage devices and their uses.	6

**UNIT-II**

Q.4(a) Write a short note on touchpad, keyboard, and joystick.	6
Q.4(b) Discuss the purpose and use of desktop items: Recycle Bin, My Computer, and My Documents.	6
Q.5(a) What is printer? Explain Laser and Dot-Matrix printer with their pros and cons.	6
Q.5(b) Explain the functions of device controllers and device drivers.	6

**UNIT-III**

Q.6(a) What is IP address? Describe various methods of connecting to the Internet.	6
Q.6(b) What do you mean by User IDs? Explain the rules to create a Passwords.	6
Q.7(a) Describe the role of web browsers and search engines in information retrieval.	6
Q.7(b) Explain e-mail and its components with example.	6

**UNIT-IV**

Q.8(a) What is non-physical threat? Write a short note on Viruses, Worms and Trojans with an example.	6
Q.8(b) Describe Cookies, Adware and Hacking with the help of example.	6
Q.9(a) Explain the concepts of confidentiality, integrity, and authentication.	6
Q.9(b) Describe backup and recovery techniques in detail?	6

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**B-601**  
**BCA/BCA-DS/BCA-CTIS II Semester Examinations (Dec 2025)**  
**Operating System (BCA-102A)**

**Time- 3hrs**  
**Max.Marks-60**

*Attempt 5 questions in all, selecting one question from each unit and Question 1 is compulsory. Each Question carries 12 marks.*

Q.1	Marks
(a) Define operating system.	2
(b) What is a process control block (PCB)?	2
(c) What is time quantum in CPU scheduling?	2
(d) Define critical section.	2
(e) What is paging in memory management?	2
(f) What is disk seek time?	2

**UNIT-I**

Q.2(a) Explain the major services provided by an operating system to users and programs.	8
Q.2(b) Discuss the importance of process management in multitasking systems.	4
Q.3(a) Describe the concept of inter-process communication (IPC) with suitable examples.	6
Q.3(b) Discuss the time-sharing operating system with a suitable example.	6

**UNIT-II**

Q.4(a) Describe the starvation problems associated with SJF scheduling.	4
Q.4(b) Demonstrate the Round Robin scheduling algorithm using a suitable example.	8
Q.5(a) State and explain the four necessary conditions for deadlock.	6
Q.5(b) Compare deadlock prevention, avoidance, and detection strategies.	6

**UNIT-III**

Q.6(a) Describe virtual memory and its role in memory management.	6
Q.6(b) Differentiate between internal and external fragmentation.	6
Q.7(a) Discuss the concept of thrashing in virtual memory systems.	4
Q.7(b) Differentiate between paging and segmentation.	8

**UNIT-IV**

Q.8(a) Discuss single-level and hierarchical directory structures.	4
Q.8(b) Discuss different types of files (sequential, indexed, direct) and their access methods with examples.	8
Q.9(a) Describe the role of disk scheduling in operating system performance.	4
Q.9(b) Compare SSTF, SCAN, and LOOK disk scheduling algorithms in terms of starvation, fairness, and average seek time	8

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A-602

BCA/BCA-DS/BCA-CTIS I Semester Examinations (Dec 2025)

Digital Logic Design (BCA-103A)

Time- 3hrs

Max.Marks-60

*Attempt 5 questions in all, selecting one question from each unit and Question 1 is compulsory. Each Question carries 12 marks.*

Q.1	Marks
(a) Solve the following: (a) $(130)_{10} = ( ? )_2$ (b) $(BCD)_{16} = (?)_2 = (?)_{10}$	2
(b) Define Weighted codes and Excess-3 codes.	2
(c) Derive the Truth Table and Boolean expressions of Ex-NOR Gate.	2
(d) Differentiate between Encoder and Decoder.	2
(e) What are the steps to design Combinational Circuits?	2
(f) Derive the characteristic equation of T-FF.	2

#### UNIT-I

Q.2(a) Perform the subtraction using 2's complement method: - $(24)_{10} - (55)_{10}$	4
Q.2(b) What are error detecting and correcting codes? Generate the Hamming code for Data bits 11001.	8
Q.3(a) Represent decimal No. 9735 in: (a) BCD (b) Excess-3 code (c) as a Binary Number.	6
Q.3(b) Represent $(-42)_{10}$ in Sign Magnitude, 1's and 2's Complement representation.	6

#### UNIT-II

Q.4(a) Simplify (a) $X'Y' + X + XY$ (b) $ZX' + ZXY = ZX$ .	6
Q.4(b) Solve the following problems using K-Map and realize the expression using gates. $F(A, B, C, D) = \sum m(0, 1, 2, 4, 5, 6, 8, 9, 12, 13, 14)$	6
Q.5(a) What are Universal gates? Design AND OR using NOR Gate and Not gate using NAND gate only.	6
Q.5(b) Convert the expression $F = (A'+B).(B+C')$ . $(B+C)$ into standard POS form and list the minterms.	6

#### UNIT-III

Q.6(a) Design Full subtractor using Half subtractor.	6
Q.6(b) What is Multiplexer? Design a 16:1 Multiplexer using 4:1.	6

- Q.7(a) What are Comparators? Design a 2-bit Comparator circuit. 6  
Q.7(b) Design a circuit to convert BCD Codes into Seven Segment Display. 6

**UNIT-IV**

- Q.8 What is a Register? State different types of Registers and define various types of modes of operation performed on registers. 12  
Q.9(a) Explain the various types of addressing modes? 6  
Q.9(b) Write the instruction codes for  $X = (A-B) + (C*D)$  6

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**B-602**

**BCA II Semester Examinations (Dec 2025)  
Object Oriented Programming using C++ (BCA-104A)**

**Time- 3hrs**

**Max.Marks-60**

*Attempt 5 questions in all, selecting one question from each unit and Question 1 is compulsory. Each Question carries 12 marks.*

<b>Q.1</b>	<b>Marks</b>
(a) Differentiate between Data Encapsulation and Data Abstraction.	2
(b) What is the difference between Structures and Unions in C++?	2
(c) Can a constructor be virtual? Justify your answer.	2
(d) Differentiate between Multiple and Multilevel inheritance.	2
(e) Which operators can not be overloaded in C++?	2
(f) What are Virtual functions? When are they used?	2

**UNIT-I**

<b>Q.2(a)</b> Compare procedural programming and object-oriented programming with at least five points of difference.	6
<b>Q.2(b)</b> Write a program to create a base class Employee and a derived class Manager. How inheritance allows reuse of code? Print all the data members of Base class and Derived class using a single function of derived class.	6
<b>Q.3(a)</b> Differentiate between compile-time and run-time polymorphism with examples in C++.	6
<b>Q.3(b)</b> Write a program to demonstrate the use of scope resolution operator to access a global variable when a local variable of the same name exists.	6

**UNIT-II**

<b>Q.4(a)</b> Demonstrate the use of static data members and static member functions in tracking the number of objects created.	6
<b>Q.4(b)</b> Write a program to show how objects can be passed as function arguments to compare two distances.	6
<b>Q.5(a)</b> Write a program to demonstrate a friend function that calculates the sum of private data members of two classes.	6
<b>Q.5(b)</b> Apply the concept of default constructor by designing a class that initializes values automatically.	6

**UNIT-III**

<b>Q.6(a)</b> Differentiate between unary and binary operator overloading with examples.	6
<b>Q.6(b)</b> Write a program to overload the binary operator (+) to add two complex numbers.	6

- Q.7(a)** Describe the role of access specifiers (public, private, protected) in inheritance. **6**
- Q.7(b)** Write a program to implement multilevel inheritance. **6**

**UNIT-IV**

- Q.8(a)** Explain the concept of a pure virtual function with an example. **6**
- Q.8(b)** Write a program to demonstrate runtime polymorphism using base class pointer and derived class objects. **6**
- Q.9(a)** Describe the use of try, throw, and catch constructs in exception handling. **6**
- Q.9(b)** Describe how to catch all exceptions using a generic catch block. **6**

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A-604

BCA/BCA-CTIS/BCA-DS/BCA-AIML I Semester Examinations (Dec 2025)

Problem Solving through C (BCA-105A)

Time- 3hrs

Max.Marks-60

*Attempt 5 questions in all, selecting one question from each unit and Question 1 is compulsory. Each Question carries 12 marks.*

Q.1

Marks

- (a) Write the difference between variable and constant.
- (b) Define keyword with two examples.
- (c) What is a break statement? Where is it used?
- (d) Define a string. How do you declare a string in C?
- (e) What is a structure?
- (f) Define pointer and write its declaration syntax

#### UNIT-I

- Q.2(a) Discuss the history and importance of C language.
- Q.2(b) Explain symbolic constants with suitable examples.
- Q.3(a) Explain any four input/output functions in C.
- Q.3(b) Describe the character set and identifiers in C.

#### UNIT-II

- Q.4(a) Explain operator hierarchy with an example.
- Q.4(b) Write a C program to find the largest among three numbers using *if-else*.
- Q.5(a) Explain switch-case statement with syntax and example.
- Q.5(b) Write a C program to print Fibonacci series using a while loop.

#### UNIT-III

- Q.6(a) Explain memory representation of 1-D and 2-D arrays.
- Q.6(b) Write a program to input 10 numbers in an array and display the maximum number.
- Q.7(a) What are string manipulation functions? Explain any four.
- Q.7(b) Write a function to add two numbers using call by reference.

#### UNIT-IV

- Q.8(a) What is an array of structures? Demonstrate with a simple example.
- Q.8(b) Explain the difference between structure and union with examples.
- Q.9(a) Explain pointer arithmetic with examples.
- Q.9(b) Write short notes on:
  - (i) Static storage class
  - (ii) Extern storage class



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**B-604**  
**BCAII Semester Examinations (Dec 2025)**  
**Introduction to Web Technology (BCA-106A)**

**Time- 3hrs**  
**Max.Marks-60**

*Attempt 5 questions in all, selecting one question from each unit and Question 1 is compulsory. Each Question carries 12 marks.*

- Q.1 Explain following : 6 X2=12
- (a) WWW
  - (b) HTML
  - (c) Object and Inheritance
  - (d) HTTP
  - (e) Handlers
  - (f) Variables

**UNIT-I**

- Q.2(a) What do you mean by web page and search engines? Discuss various contents of Internet. 6
- Q.2(b) What is ISP? Explain the steps for website developing website in detail. 6
- Q.3(a) Compare the features of dynamic and static websites with illustration. 6
- Q.3(b) Explain Request and response message. Discuss the role of URL. 6

**UNIT-II**

- Q.4(a) Create a table in HTML for maintaining record of students. 6
- Q.4(b) Create a structure in HTML showcasing use of ordered and unordered list. 6
- Q.5(a) Illustrate with example internal and external hyperlink in HTML. 6
- Q.5(b) Explain about image tag and formatting tags of HTML with example. 6

**UNIT-III**

- Q.6(a) What is CSS? Explain various features of CSS and CSS text properties. 6
- Q.6(b) Write code for creating a CSS Table; color properties with example. 6
- Q.7(a) Explain CSS selectors and their roles. Also discuss CSS Display properties. 6
- Q.7(b) Define CSS Box Model . Give illustration. 6

**UNIT-IV**

- Q.8(a) Discuss about Javascript. Write a program showcasing use of various operators with example. 6
- Q.8(b) Write syntax of function in Javascript. Give example.. 6
- Q.9(a) Explain about DOM and explain process of adding and deleting elements. 6
- Q.9(b) Illustrate with example finding HTML elements in HTML DOM. 6

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**B-641**

**BCA-CTIS/BCA-DS II/III Semester Examinations (Dec 2025)**

**Data Structures using C++ (BCA-112A)**

**Time- 3hrs**

**Max.Marks-60**

*Attempt 5 questions in all, selecting one question from each unit and Question 1 is compulsory. Each Question carries 12 marks.*

	<b>Marks</b>
Q1.	
a. Explain Encapsulation?	2
b. What is abstract data?	2
c. Explain recursion with example.	2
d. Explain the applications of queue.	2
e. Explain application of linked list.	2
f. Differentiate between structure and class.	2

**UNIT-1**

Q2.a	What are the main features of Object-Oriented programming?	6
Q2.b	Write a program to enter details (student roll.no, student name, class) of 10 students using class.	6
Q3.a	Write a program demonstrating how to pass objects to functions and return objects from functions	6
Q3.b	What is data hiding? Explain in detail.	6

**UNIT-II**

Q4.a	Explain different types of data structure with their advantages and disadvantages.	8
Q4.b	What is an array? Explain memory representation of arrays.	4
Q5.a	Write an algorithm for traversal, insertion, and deletion of an element in the array.	6
Q5.b	What are asymptotic notations?	4

**UNIT-III**

Q6.a	What is stack? Write an algorithm to push, pop and search for an element in the stack.	8
Q6.b	Convert infix expression into polish notation $[A * \{B + C * (D + E)\}] / \{F * (G + H)\}$	4
Q7.a	What is queue? Write an algorithm to traverse all the elements in the queue.	6
Q7.b	What is the limitation of queue? Also explain how to insert an element in a circular queue?	6

**UNIT-IV**

- |      |   |   |
|------|---|---|
| Q8.a | Explain double linked list? Also write an algorithm to delete an element in double link list.                   | 6 |
| Q8.b | Explain binary search algorithm with suitable example.  | 6 |
| Q9.a | What is quick sort? Write an algorithm to sort array using Quick sort. Also, find the complexity of quick sort. | 6 |
| Q9.b | Write an algorithm to insert and search for an element in linked list.  | 6 |

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B-642

BCA-CTIS II Semester Examinations (Dec 2025)

Introduction to Cloud Computing (BCA-114A)

Time- 3hrs

Max.Marks-60

*Attempt 5 questions in all, selecting one question from each unit and Question 1 is compulsory. Each Question carries 12 marks.*

**Q.1**

- |     |   |   |
|-----|---|---|
| (a) | Suggest one example of hybrid and community cloud in real life.     | 2 |
| (b) | Explain cloud bursting with suitable example.                       | 2 |
| (c) | What is SPI?  | 2 |
| (d) | Who are malicious insider and what mitigation can be used for this? | 2 |
| (e) | How cloud computing is different from traditional computing?        | 2 |
| (f) | Describe the role of hypervisor.                                    | 2 |

**UNIT-I**

- |               |   |    |
|---------------|---|----|
| <b>Q.2(a)</b> | Describe the various challenges of cloud computing.   | 6  |
| <b>Q.2(b)</b> | What are the various applications of cloud computing? | 6  |
| <b>Q.3</b>    | Draw and discuss the architecture of cloud computing. | 12 |

**UNIT-II**

- |            |  |    |
|------------|--|----|
| <b>Q.4</b> | Discuss various cloud deployment models along with their benefits, drawbacks and challenges. | 12 |
| <b>Q.5</b> | Explain the following terms:<br>a) SLA management.<br>b) PaaS.                               | 12 |

**UNIT-III**

- |               |  |    |
|---------------|--|----|
| <b>Q.6</b>    | In reference to virtualization, explain:<br>a) Desktop virtualization.<br>b) Storage virtualization. | 12 |
| <b>Q.7(a)</b> | Differentiate between Type I and Type II hypervisor.   | 6  |
| <b>Q.7(b)</b> | Explain virtual machine provision and service migration.   | 6  |

**UNIT-IV**

- |               |   |    |
|---------------|---|----|
| <b>Q.8(a)</b> | How is service hijacking performed? What preventive measures you would suggest to Aadhaar authority to avoid service hijacking? | 6  |
| <b>Q.8(b)</b> | Explain the following terms:<br>(i) Hybrid cloud.<br>(ii) Tools and technologies for cloud.                                     | 6  |
| <b>Q.9</b>    | Draw and discuss the cloud security reference model.  | 12 |

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A-407

**BBA I Semester Examinations (Dec 2025)  
Basic IT Skills (BCA-115A)**

**Time- 3hrs  
Max.Marks-60**

*Attempt 5 questions in all, selecting one question from each unit and Question 1 is compulsory.  
Each Question carries 12 marks.*

Q.1	Marks
(a) What is portability?	2
(b) Write two examples of secondary storage devices.	2
(c) Define middleware.	2
(d) What is transition effect?	2
(e) Define filtering in Excel.	2
(f) What is workbook?	2

**UNIT-I**

Q.2(a) Draw a neat diagram explaining Components of Computer System,	3
Q.2(b) Write detailed working of any three output devices with suitable diagrams.	9

**OR**

Q.3(a) How can one reach the Control Panel in a Windows computer? Explain different properties that can be controlled in display of a computer using it.	9
Q.3(b) Write steps to add/remove Programs in a computer.	3

**UNIT-II**

Q.4(a) Why is an operating system required in a computer? Justify your answer.	3
Q.4(b) Write technical notes on the types of computer languages.	9

**OR**

Q.5(a) Explain the working of compiler, assembler and an interpreter. Give examples of each type.	9
Q.5(b) Name at least three GUI based application software and their use.	3

**UNIT-III**

Q.6(a) How many types of Word Processor views are there? For each view type, describe a real scenario where it is the most suitable choice to view the contents of a document.	9
Q.6(b) Write two advantages of using WordArt.	3

**OR**

Q.7(a) Compare Word macros and manual formatting techniques.	3
Q.7(b) Discuss the use of multimedia elements in PowerPoint and its influence on audience engagement and cognitive load.	9

**UNIT-IV**

Q.8(a) How are cell references used in formulas in Excel? Explain difference between relative, absolute, and mixed cell references with examples. 9

Q.8(b) Explain the difference between VLOOKUP and HLOOKUP. 3

**OR**

Q.9(a) Discuss the role of conditional formatting in data analysis. 3

Q.9(b) Explain steps to create a PivotTable and write its use and usefulness. 9

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B-407

BBA/BBA(DM)/BBA(BA) II Semester Examinations (Dec 2025)

Advance IT Skills (BCA-116A)

Time- 3hrs

Max.Marks-60

*Attempt 5 questions in all, selecting one question from each unit and Question 1 is compulsory. Each Question carries 12 marks.*

Q.1	Marks
(a) What is a web browser?	2
(b) What does downloading mean?	2
(c) What are Google Services?	2
(d) What is meant by <i>cyberspace</i> ?	2
(e) What is the difference between hacking and phishing?	2
(f) What is the Internet of Things (IoT)?	2

**UNIT-I**

Q.2(a) What are the main functions of a web browser? What is the difference between a web browser and a search engine?	3x2=6
Q.2(b) What are different ways to connect to the Internet?	6

**OR**

Q.3(a) What is a website address? What are the parts of a website address? What is the difference between a website and a webpage?	2x3=6
Q.3(b) What is E-Commerce? What are the main requirements for E-Commerce?	2+4=6

**UNIT-II**

Q.4(a) What are the benefits of using Google Services? Give examples of popular Google Services and their uses.	3x2=6
Q.4(b) What is collaboration in Google Workspace? How do you share a Google document with others?	3x2=6

**OR**

Q.5(a) How can Google Sheets help in data analysis?	6
Q.5(b) How do you create a Google Form? How do you collect responses in Google Forms?	3x2=6

**UNIT-III**

Q.6(a) Define Cyber Security.	3x2=6
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Why is cyber security important in the digital age?  
**Q.6(b)** How are cybercrimes classified? **6**

**OR**

**Q.7(a)** What are some major objectives of the IT Act 2000? **6**

**Q.7(b)** Name some key Indian organizations dealing with cyber security and cybercrime. **6**

**UNIT-IV**

**Q.8(a)** What are the main applications of AI? **6**

**Q.8(b)** What are the main features of blockchain technology? **6**

**OR**

**Q.9(a)** What are some challenges associated with mobile and social technologies? **6**

**Q.9(b)** What are the benefits and limitations of 3D printing? **6**

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**A-661**  
**BCA-AIML I Semester Examinations (Dec 2025)**  
**Office Automation Tools (BCA-121A)**

**Time- 3hrs**  
**Max.Marks-60**

*Attempt 5 questions in all, selecting one question from each unit and Question 1 is compulsory. Each Question carries 12 marks.*

Q.1	Compulsory Question.	Marks
(a)	What do mean by multiprocessing operating system?	2
(b)	What are templates in MS word?	2
(c)	How to insert rows and columns in Excel Worksheet?	2
(d)	What is gutter margin?	2
(e)	What is difference between file and folder?	2
(f)	How to apply a theme to a slide in MS Power Point?	2

**UNIT-I**

Q.2(a)	What is operating system? Explain its features and functions.	9
Q.2(b)	Differentiate between application and system software?	3
Q.3	What do you mean by desktop? Describe its key components and their functions in detail.	12

**UNIT-II**

Q.4(a)	Explain various paragraph formatting features used in MS Word.	6
Q.4(b)	Discuss the following text proofing features in MS word 1. Spell check 2. Auto correct	6
Q.5(a)	Define macros and their purpose with help of a suitable example.	6
Q.5(b)	What do you mean by table? Explain various methods for creating a table.	6

**UNIT-III**

Q.6(a)	Explain the different types of alignment of cell contents, allowed in MS Excel.	6
Q.6(b)	Explain different types of charts in MS Excel.	6
Q.7(a)	Define workbook. Describe the steps for creating, saving and editing a workbook.	6
Q.7(b)	Explain various data types used in MS Excel.	6

**UNIT-IV**

Q.8(a)	What is a clip art? How it is useful in MS PowerPoint presentation.	6
Q.8(b)	What do you mean by animations? Write down steps to apply animations in a slide.	6
Q.9(a)	Explain key features and uses of MS Power Point.	6
Q.9(b)	Explain about deleting, duplicating and rearranging slides using slide sorter view in MS PowerPoint.	6

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B-621

BCA-DS II Semester Examinations (Dec 2025)

Programming in Python (BCA-122A)

Time- 3hrs

Max.Marks-60

Attempt 5 questions in all, selecting one question from each unit and Question 1 is compulsory. Each Question carries 12 marks.

Q.1	Marks
(a) Define variables in Python. How are they different from identifiers?	2
(b) Differentiate between mutable and immutable data types with suitable examples.	2
(c) Explain the difference between 'is' and '==' operators with examples.	2
(d) What is the use of indentation in Python?	2
(e) Write a Python program to find the largest of three numbers using nested if.	2
(f) Differentiate between a list and a tuple.	2

#### UNIT-I

Q.2(a) Explain the various standard data types available in Python. Give examples of each.	6
Q.2(b) Write a Python program to accept the radius from the user and calculate the area and circumference of a circle using the math module.	6
Q.3(a) What are identifiers? Write rules for naming identifiers in Python.	6
Q.3(b) Write a Python program to calculate the simple interest and compound interest.	6

#### UNIT-II

Q.4(a) Explain the different types of operators in Python with examples.	6
Q.4(b) Write a Python program that takes a number from the user and checks whether it is prime or not.	6
Q.5(a) Discuss the use of break, continue, and pass statements with examples.	6
Q.5(b) Write a Python program to print the Fibonacci series up to n terms using a while loop.	6

#### UNIT-III

Q.6(a) Examine various string operations in Python. Differentiate between string slicing, concatenation, and traversal with suitable examples.	6
Q.6(b) Write a Python program to create a dictionary of student names and marks. Display the name of the student with the highest marks.	6
Q.7 Compare and contrast the properties, usage, and behavior of Tuples and Lists in Python. Evaluate their performance and suitability for different programming scenarios. Support your answer with code examples.	12

#### UNIT-IV

- Q.8(a)** Explain the concept of functions in Python. How are default and keyword arguments handled? Give examples. **6**
- Q.8(b)** Write a Python program using a recursive function to calculate factorial of a number. **6**
- Q.9(a)** What is a lambda function? How is it different from a user-defined function? Give suitable examples. **6**
- Q.9(b)** Write a Python program to square each element of a list using map() and a lambda function. **6**

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**B-622**  
**BCA-DS II Semester Examinations (Dec 2025)**  
**Office and Spreadsheet Tools (BCA-124A)**

**Time- 3hrs**  
**Max.Marks-60**

*Attempt 5 questions in all, selecting one question from each unit and Question 1 is compulsory. Each Question carries 12 marks.*

	<b>Marks</b>
Q.1 Compulsory Question.	
(a) Write down any two features of window operating system.	2
(b) Differentiate between worksheet and spreadsheet in MS Excel.	2
(c) Describe the purpose of 'Find and Replace' in MS Word.	2
(d) What is the difference between paste and paste special?	2
(e) What is slide?	2
(f) What is the purpose of spell check in MS Word?	2

**UNIT-I**

Q.2(a) What is Operating System? Discuss about some popular Operating Systems.	6
Q.2(b) What is software? Explain various types of computer software's.	6
Q.3(a) What is control panel in Windows operating system? Write down its functions.	6
Q.3(b) Describe the steps to change the display settings of your computer using control panel.	6

**UNIT-II**

Q.4(a) What is mail merge? Explain about mail merge in MS-word.	6
Q.4(b) Explain the use of smart art in Ms word.	6
Q.5 Explain the following in MS-Word.	12
1. Headers and Footers	
2. Bullets and Numbering	

**UNIT-III**

Q.6(a) What is a spreadsheet? Discuss about features of MS-Excel spreadsheet.	6
Q.6(b) Write down steps to create a chart in Excel worksheet with the help of an example.	6
Q.7 Describe the syntax, use and purpose of five built-in functions used in MS-Excel with examples.	12

**UNIT-IV**

Q.8(a) What are the main features of a good Power Point presentation?	6
Q.8(b) How can excel charts be added in a slide in MS Power Point?	6
Q.9(a) What is Table? Write down steps of inserting a Table in the Power Point slide.	6
Q.9(b) Explain the following:	6
1. Normal view	
2. Slide view	
3. Slide sorter view	

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C-601

BCA/BCA-CTIS III Semester Examinations (Dec 2025)

Software Engineering (BCA-201A)

Time- 3hrs

Max.Marks-60

*Attempt 5 questions in all, selecting one question from each unit and Question 1 is compulsory. Each Question carries 12 marks.*

Q.1	Marks
(a) What is software?	1.5
(b) Why is there a need for software engineering?	1.5
(c) Describe requirement elicitation in short?	1.5
(d) Define data dictionary.	1.5
(e) What is software design?	1.5
(f) Define cohesion and coupling in software engineering.	1.5
(g) Define software metrics.	1.5
(h) Why are metrics important in software engineering?	1.5

**UNIT-I**

Q.2(a) Analyze the major causes of the software crisis.	6
Q.2(b) Apply the myth “Adding more software engineers will reduce delay” to a real-world project and explain the possible consequences. Also explain the myth “Testing or proving software correct removes all errors”.	6
Q.3(a) Analyze the need of software engineering and major causes of the software evolution. Illustrate with examples such as (i) Y2K problem (ii) Patriot Missile failure (iii) Ariane-5 Rocket Crash.	6
Q.3(b) Identify various characteristics of a good software product.	6

**UNIT-II**

Q.4(a) Construct a diagram illustrating the phases of the Waterfall Model and explain how data flows between phases.	6
Q.4(b) Develop and illustrate a Level-1 Data Flow Diagram for a Result Management System. Analyze the interaction between the system’s processes, data stores, and external entities using standard DFD.	6
Q.5(a) Analyze the effectiveness of Interviews, and Quality Function Deployment for eliciting requirements in a complex software project.	6
Q.5(b) Distinguish between Evolutionary and Prototyping models in software engineering.	6

### UNIT-III

- Q.6(a) Distinguish between conceptual design and technical design of software. 6
- Q.6(b) Examine how different types of coupling impact system design of software. 6
- Q.7(a) Examine objectives and importance of software design in software development. 6
- Q.7(b) Compare object-oriented design and function-oriented design. 6

### UNIT-IV

- Q.8(a) Categorize the software metrics: Product metrics, Process metrics, Project metrics and describe token count metric. 6
- Q.8(b) Distinguish between Bug, Mistake, Error, Fault, and Failure in the context of Software Engineering. 6
- Q.9(a) Compare Alpha and Beta Testing with respect to testing environment, testers, objectives, feedback process. 6
- Q.9(b) Compare Unit Testing, Integration Testing, and System Testing based on their objectives, scope, and responsibility. 6

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C-603

BCA/BCA-CTIS/BCA-DS III Semester Examinations (Dec 2025)

Database Management System (BCA-203A)

Time- 3hrs

Max.Marks-60

Attempt 5 questions in all, selecting one question from each unit and Question 1 is compulsory. Each Question carries 12 marks.

Q.1	(Compulsory) – Attempt any six subparts:	Marks
(a)	Define Entity and Attribute with one example each.	
(b)	Differentiate between Strong and Weak Entities.	
(c)	What is the significance of Data Abstraction in DBMS?	
(d)	List different types of data models.	
(e)	Define Transaction and its ACID properties.	
(f)	Define Partial Dependency and Transitive Dependency.	
(g)	What is a Data Warehouse?	
(h)	Give one example each of DDL and DML commands.	

**UNIT-I**

Q.2(a)	Elucidate the Three-Schema Architecture of DBMS with a neat diagram.	6
Q.2(b)	Design an ER diagram for a “Library Management System” that includes entities like Books, Members, and Loans. Identify keys and relationships.	6
Q.3(a)	Explain Specialization and Generalization with suitable examples.	5
Q.3(b)	What are different types of Keys? Discuss with examples	7

**UNIT-II**

Q.4(a)	Write SQL statements for the following queries on the table COURSE(course_id, name, instructor, credits, semester): (i) Display all courses taught by “XYZ”. (ii) Find the average credits of courses offered in 3rd semester. (iii) Display the course with the maximum credits.	6
Q.4(b)	Explain how <i>views</i> and <i>indexes</i> can be used to improve database performance and security. Give suitable SQL examples.	6
Q.5(a)	Explain architecture and basic elements of PL/SQL.	6
Q.5(b)	Write and explain a PL/SQL block to display the factorial of a number.	6

**UNIT-III**

Q.6(a)	Define BCNF and explain the steps to decompose a relation into BCNF with an example	6
Q.6(b)	Normalize the following relation up to 3NF: R(A, B, C, D, E) with FDs: {A→B, B→C, AC→D, D→E}.	6
Q.7(a)	Explain the difference between 4NF and 5NF with examples	6

Q.7(b) Explain Relational Algebra operations with suitable examples for Union, Intersection, and Division. 6

**UNIT-IV**

Q.8(a) Explain two-phase locking protocol with an example. 6

Q.8(b) Distinguish between Conflict Serializability and View Serializability. Illustrate with an example schedule and test its serializability. 6

Q.9(a) Discuss characteristics of data warehouses. 6

Q.9(b) Write short notes on: 6

(i) Data Mining Process

(ii) Recoverable and Cascadeless schedules.

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**C-604**  
**BCA III Semester Examinations (Dec 2025)**  
**Programming with Java (BCA-205A)**

**Time: 3 hours**  
**Max. Marks-60**

*Attempt 5 questions in all, selecting one question from each unit and Question 1 is compulsory. Each Question carries 12 marks.*

Q1.	Marks
a) What is the difference between a while loop and a do-while loop in Java?	2
b) How do you declare and initialize an array of integers with 5 elements in Java?	2
c) What is the difference between the static and final keywords in Java?	2
d) What are the steps to create a user-defined package and use its class in another program?	2
e) What is object serialization in Java, and why is it used?	2
f) What is a thread priority, and how can you set it in Java?	2

**UNIT-I**

Q2. (a) What is the role of Java Virtual Machine (JVM) and how does bytecode contribute to Java's platform independence?	6
Q2. (b) Write a Java program that reads an integer from the user and prints whether the number is positive, negative or zero using if-else statements.	6
Q3. (a) Explain the steps involved in declaring, initializing and accessing elements of an array in Java.	6
Q3. (b) Explain how the switch statement works in Java and write a Java program that prints the name of a weekday based on a number (1-7).	6

**UNIT-II**

Q4. (a) Define a class in Java and explain its components (fields and methods) with examples. Discuss the relationship between a class and its objects in terms of memory allocation and behavior.	6
Q4. (b) Explain the difference between a default constructor and a parameterized constructor in Java with examples.	6
Q5. (a) Write a program that demonstrates the creation of user-defined interface <i>Shapes</i> containing a class <i>Circle</i> with methods to calculate area. Show how to compile and access this interface in a main program.	7
Q5. (b) What are access modifiers in Java? Explain the purpose of each access modifier: public, private, protected and default.	5

### UNIT-III

- Q6. (a) What is package? Write a program to create and access package in java? 5
- Q6. (b) Explain the difference between the throw and throws keywords in Java. Write a program to create a user-defined exception InvalidAgeException that is thrown when a user enters an age less than 18. 7
- Q7. (a) What is a finally block in Java and when is it executed? Write a Java program that demonstrates the use of a finally block along with a try-catch statement. 6
- Q7. (b) Explain the difference between checked and unchecked exceptions in Java. Give examples of each type. 6

### UNIT-IV

- Q8. (a) How can you read input from the console using java.util.Scanner? Write a Java program to read a user's name and age from the console and display it back. 6
- Q8. (b) What are character streams and byte streams in Java? Explain the main differences between them and give examples of classes for each type. 6
- Q9. (a) Differentiate between a process and a thread in Java? Explain the advantages of multithreading over multiple processes. 6
- Q9. (b) What is thread synchronization in Java and why is it important? Explain the use of the synchronized keyword with an example. 6

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C-602

BCA III Semester Examinations (Dec 2025)

Data Structures (BCA-207A)

Time- 3hrs

Max.Marks-60

*Attempt 5 questions in all, selecting one question from each unit and Question 1 is compulsory. Each Question carries 12 marks.*

Q.1

Marks

- (a) Find the complexity of  $3n^2 + 5n$ .
- (b) What are overflow and underflow conditions in STACK?
- (c) What is garbage collection?
- (d) What will be the result of following:  
DELETE ('ABCDEFGH', 4,2)
- (e) State any two advantages of linked lists over arrays.
- (f) How the polynomials are represented using linked list

#### UNIT-I

- Q.2(a) How can we say whether a particular algorithm is good or bad? What are the different techniques used for this purpose?
- Q.2(b) Describe the characteristics of a good data structure. Why is choosing the right data structure essential in software development?
- Q.3(a) Differentiate between linear and non-linear data structures. Give examples and discuss situations where each type is preferred.
- Q.3(b) What is the importance of average-case complexity. Why is it often more meaningful than best-case complexity?

#### UNIT-II

- Q.4(a) In array B[-1:10,5:14], what is :-
  - i. The length of each direction.
  - ii. The number of elements that can be stored.
  - iii. If the starting address of the array is 300 and the size of each element in the array is 8, what is the address of the element B [5, 8]?
- Q.4(b) Discuss different types of storage class specifiers. Give examples.
- Q.5(a) Differentiate with suitable example about the representation of sparse matrix.
- Q.5(b) Explain the difference between array representation and pointer representation of strings.

### UNIT-III

- Q.6(a) Convert the following infix expression into postfix using stack:  
 $A^B * C - D + E / F / (G + H)$
- Q.6(b) What is a Circular Queue? Explain its advantages over a linear array-based queue and how it addresses the “wasted space” problem.
- Q.7(a) Write the pseudocode for the pop() operation on an array-based stack.
- Q.7(b) Define Queue ADT. What are the various applications of queues.

### UNIT-IV

- Q.8(a) Explain the structure of a linked list. Compare it with arrays in terms of memory allocation, flexibility, and performance.
- Q.8(b) Discuss different insertion operations on a singly linked list (beginning, end, specific position). Provide example steps.
- Q.9(a) Consider a given list of numbers in sorted order: 10,20,30,40,50,60,70,80,90  
Write a program or pseudo code to search an item 80 in the above list using Binary Search. Show all the steps.
- Q.9(b) Using quick sort algorithm sort the Given Array: [25, 15, 40, 10, 30, 20]; Use pivot = last element (20). Perform a single partition step. Write final array and partition index.

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C-407

BBA/BBA(DM)/BBA(BA) III Semester Examinations (Dec 2025)

Data Base Management System (BCA-209A)

Time- 3hrs

Max.Marks-60

*Attempt 5 questions in all, selecting one question from each unit and Question 1 is compulsory. Each Question carries 12 marks.*

Q.1		Marks
(a)	Define schema and instance. How do they differ in the context of a database?	2
(b)	What is normalization? State its main objective.	2
(c)	Define atomicity as a property of transactions and explain its importance.	2
(d)	What is the relational data model?	2
(e)	What is an index in DBMS? How does indexing improve query performance?	2
(f)	What is a multimedia database? Mention two types of media it stores.	2

#### UNIT-I

Q.2(a)	What is a data model? Differentiate between the hierarchical model, network model, and relational model.	6
Q.2(b)	What do you mean by a Database Management System? Describe the key components of a DBMS.	6

**OR**

Q.3(a)	Describe the approach taken to handling data in early file-based systems. Discuss the disadvantages of this approach.	6
Q.3(b)	Who are the different types of database users? Explain the role of each user.	6

#### UNIT-II

Q.4(a)	What is DDL? Make a list of commands with a short description used in DDL.	6
Q.4(b)	Design an E-R diagram for the bank-customer relationship, where each bank can have multiple branches, and each branch can have multiple accounts and loans.	6

**OR**

Q.5(a)	What is the HAVING clause? How is it different from the WHERE clause? Write a query using GROUP BY and HAVING clause.	6
Q.5(b)	What are aggregate functions? Explain each of the following: COUNT, MIN, MAX and AVG.	6

### UNIT-III

- Q.6(a) Explain the terms primary key, candidate key, alternate key and secondary key. In the given table identify each key STUDENT (SID, Regno, Name, City). 6
- Q.6(b) What is Boyce–Codd Normal Form (BCNF)? How is it stronger than 3NF? 6

#### OR

- Q.7(a) State and explain Armstrong’s Axioms (Inference Rules) used for functional dependencies. 6
- Q.7(b) Define Second Normal Form (2NF). Why is 2NF required even if a relation is already in 1NF? 6

### UNIT-IV

- Q.8(a) What is a multimedia database? Explain its major components. 6
- Q.8(b) Compare SQL and NoSQL databases based on structure, scalability, and schema. 6

#### OR

- Q.9(a) Explain the advantages and challenges of using databases for web applications. 6
- Q.9(b) Differentiate between shared-memory, shared-disk, and shared-nothing architectures in parallel databases. 6

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C-641

BCA-CTIS III Semester Examinations (Dec 2025)  
Linux and Shell Programming (BCA-211A)

Time- 3hrs  
Max.Marks-60

Attempt 5 questions in all, selecting one question from each unit and Question 1 is compulsory.  
Each Question carries 12 marks.

Q.1	Marks
(a) Write any two features of Linux operating system.	2X6=12
(b) Name any two file-oriented Linux commands and their working.	
(c) What is the function of chmod?	
(d) Define an <i>inode</i> .	
(e) Define a shell script.	
(f) What is the <i>init</i> command used for?	

UNIT-I

Q.2(a) Describe the main features of Linux. How is Linux different from other operating systems?	6
Q.2(b) Explain any three <i>vi</i> commands.	6
Q.3(a) Describe the structure and purpose of the Linux file system hierarchy.	9
Q.3(b) Illustrate the role of the PATH variable.	3

UNIT-II

Q.4(a) Explain file access permissions in Linux. Describe <i>chmod</i> , <i>chgrp</i> , and <i>umask</i> with examples.	6
Q.4(b) Describe the different process states in Linux with a neat state transition diagram.	6
Q.5(a) Explain process management commands: <i>ps</i> , <i>kill</i> , <i>nice</i> , <i>bg</i> , <i>fg</i> , <i>jobs</i> .	9
Q.5(b) Explain the output of the <i>ls -l</i> command.	3

UNIT-III

Q.6(a) Write short notes on: (i) Conditional execution (ii) File tests (iii) String tests	9
Q.6(b) Demonstrate the use of <i>sort</i> , and <i>wc</i> commands.	3
Q.7(a) Write a shell script to accept a filename and display the number of lines, words, and characters.	9
Q.7(b) Describe the structure of a shell script.	3

UNIT-IV

Q.8(a) Describe the process of creating, mounting, and unmounting a file system.	6
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- Q.8(b) Why is account management important in linux? Explain any three user account management commands of your choice. 6
- Q.9(a) What steps are involved in shutting down and rebooting a Linux system safely? 6
- Q.9(b) What is a disk block? Describe the allocation of disk blocks in Linux. 6

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C-642

**BCA-CTIS III Semester Examinations (Dec 2025)  
Introduction to Information Security (BCA-213A)**

**Time- 3hrs**

**Max.Marks-60**

*Attempt 5 questions in all, selecting one question from each unit and Question 1 is compulsory. Each Question carries 12 marks.*

Q.1	Marks
(a) Define the term CIA triad.	2
(b) Write down any 3 issues of Information Security.	2
(c) What is Network security model?	2
(d) Briefly explain Intrusion Detection System.	2
(e) What is the need of Email Security?	2
(f) Briefly explain SDLC.	2

**UNIT-I**

Q.2(a) Explain in detail Security services and Mechanisms.	6
Q.2(b) What is Security Architecture? Give various elements of security architecture.	6
Q.3(a) Briefly explain Threat and Vulnerability with example.	4
Q.3(b) Explain any 3 types of security attacks on Availability & Integrity.	8

**UNIT-II**

Q.4(a) Define following terms: i) Cryptography ii) Steganography	4
Q.4(b) Explain Encryption and Decryption technique in detail.	8
Q.5(a) What is authentication method? Explain following authentication methods in detail: i) Multi-factor ii) Password	4
Q.5(b) Explain following access control models in detail: i) RBAC ii) MAC	8

**UNIT-III**

Q.6(a) What is Intrusion Prevention system? How such systems can help to provide information security?	8
Q.6(b) Explain following terms related to Firewall: i) Types of Firewall ii) Features of Firewall	4
Q.7(a) What is XSS? How such attacks can be avoided?	6
Q.7(b) Explain Secure Coding Practice in detail.	6

**UNIT-IV**

Q.8(a) Differentiate between System Hardening & Patch management.	4
Q.8(b) Write down OS security vulnerabilities in detail. Also explain Patch management with example.	8
Q.9(a) Explain PGP and SMIME Email Security techniques in detail.	6
Q.9(b) Explain the following terms related to Web Security: i) Web Security Tools ii) SQL Injection iii) Web Browser Security	6

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C-643

BCA-CTIS III Semester Examinations (Dec 2025)

Full Stack Development-I (MERN) (BCA-215A)

Time- 3hrs

Max.Marks-60

*Attempt 5 questions in all, selecting one question from each unit and Question 1 is compulsory. Each Question carries 12 marks.*

Q.1	Attempt all parts. Each question carries 2 marks.	Marks
(a)	Explain any two key features of Node.js that make it suitable for backend development.	2x6 = 12
(b)	Compare Functional and Class Components in React with one example of each.	
(c)	What is the role of Express.js in a MERN application?	
(d)	Write any two differences between Callbacks and Promises in Node.js.	
(e)	What is the importance of Props Drilling and how does Context API help avoid it?	
(f)	What are Environment Variables in Node.js? State their use with an example scenario	

#### UNIT-I

Q.2(a)	Explain the MERN stack and discuss its advantages for full-stack web development.	6
Q.2(b)	Compare Client-side JavaScript with Server-side JavaScript with suitable examples.	6
Q.3(a)	Describe the installation process of Node.js and npm. Explain how to create and run a basic Node.js script.	6
Q.3(b)	Explain the architecture of Node.js with emphasis on the event-driven and non-blocking I/O model.	6

#### UNIT-II

Q.4(a)	What is React.js? Explain its key features and the role of the Virtual DOM in improving application performance.	6
Q.4(b)	Explain the difference between Functional Components and Class Components in React with suitable examples.	6
Q.5(a)	What are React Hooks? Explain the usage of useState and useEffect hooks with examples.	6
Q.5(b)	Discuss Controlled and Uncontrolled Components in forms handling in React. Provide suitable examples.	6

#### UNIT-III

Q.6(a)	Explain Node.js architecture and the role of the Event Loop in handling asynchronous operations.	6
Q.6(b)	What are Node.js modules? Explain core modules, global modules, and user-defined modules with examples.	6
Q.7(a)	What is Express.js middleware? Discuss different types of middleware and illustrate with examples.	6

Q.7(b) Explain the role of Mongoose in MongoDB integration. Describe the steps to create a schema and perform basic CRUD operations. 6

**UNIT-IV**

Q.8(a) Explain asynchronous programming in Node.js. Compare Callbacks, Promises, and Async/Await with suitable code examples. 6

Q.8(b) Describe the Event Loop in Node.js. How does it handle non-blocking I/O operations? Illustrate with a diagram. 6

Q.9(a) Explain the process of implementing authentication and authorization in a MERN application using JWT and bcrypt. 6

Q.9(b) What is Multer? Explain how to handle file uploads in a Node.js application using Multer with an example. 6

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C-622

BCA-DS III Semester Examinations (Dec 2025)

Introduction to Data Science (BCA-221A)

Time- 3hrs

Max.Marks-60

*Attempt 5 questions in all, selecting one question from each unit and Question 1 is compulsory. Each Question carries 12 marks.*

Q.1	Marks
(a) What is Data Science?	2
(b) Explain importance of data-driven decision-making in real scenario.	2
(c) What is API?	2
(d) What are outliers?	2
(e) Differentiate between descriptive analytics and inferential analytics.	2
(f) Explain data encoding in visualization.	2
<b>UNIT-I</b>	
Q.2(a) Explain the phases of Data Science in detail with suitable example.	8
Explain the applications of Data Science in real world.	4
Q.2(b)	
Q.3(a) How Data science is revolutionizing diseases prediction.	6
Q.3(b) What is EDA? What is the purpose of EDA in data science?	6
<b>UNIT-II</b>	
Q.4(a) Explain various data collections methods with advantages and disadvantages.	7
Q.4(b) Explain metadata and data provenance	5
Q.5(a) What is data quality? Explain data quality issues in Data Science and also explain how to solve them.	8
Q.5(b) Explain various types of data sources.	4
<b>UNIT-III</b>	
Q.6(a) Explain data transformation techniques with suitable example.	6
Q.6(b) Explain data storage models in data science.	6
Q.7(a) How missing values are treated in data preparation phase?	5
Q.7(b) Why data reduction is required before analyzing the data? Also explain data reduction techniques in detail with example.	7
<b>UNIT-IV</b>	
Q.8(a) Find out the variance and standard deviation of following dataset 23,34,45,47,67,34,78,22, 65,87.	5
Q.8(b) What are Inferential Analytics? Also explain how inferential analysis works?	7
Q.9(a) Explain various types of Charts used for data visualization.	7
Q.9(b) Explain the consequences of misleading data visualizations.	5

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C-623

BCA-DS III Semester Examinations (Dec 2025)

Fundamentals of R Programming (BCA-223A)

Time- 3hrs

Max.Marks-60

*Attempt 5 questions in all, selecting one question from each unit and Question 1 is compulsory. Each Question carries 12 marks.*

Q.1	Marks
(a) Write any two reasons why R is popular for statistical computing.	2X6=12
(b) State the use of the `help()` or `?` operator in R.	
(c) Give one simple example situation where recursion is useful.	
(d) Define a data frame and mention how it differs from a matrix.	
(e) What is a scatter plot? What kind of relationship does it help to visualize?	
(f) What is the purpose of the `read.csv()` function in R?	

**UNIT-I**

Q.2(a) Explain the overall architecture of the R environment.	6
Q.2(b) What logical operators are available in R? Explain the working of any two logical operators by giving an example and a code statement.	6
Q.3(a) Define vectors. Discuss the concept of vectorization in R. How to declare a vector containing numeric values. Illustrate with a short example.	9
Q.3(b) Write short technical notes on Tribbles.	3

**UNIT-II**

Q.4(a) Differentiate between While and Do-While looping statements by giving the syntax, example, and explaining their working	9
Q.4(b) Define String. Explain any three string manipulation functions with code and examples.	3
Q.5(a) Write the syntax of defining a matrix in R. Write a code that defines a general 3×3 matrix, and write a command that manipulates two elements of this matrix, updating a row with some new elements.	6
Q.5(b) Define Recursion. In which scenarios is it preferred? Justify your answer.	6

**UNIT-III**

Q.6(a) Describe three string operations by taking an initial string, and provide the code snippets for each operation and the result that it will produce.	6
Q.6(b) Distinguishes between vectors, matrices, and arrays in terms of dimension attributes. Give small generic examples of each and describe one operation commonly applied to each structure.	6
Q.7(a) Discuss the process of subsetting data frames using: - column names, - row indices, and - logical conditions.	9

Q.7(b) Describe general steps to read an external data file. 3

**UNIT-IV**

Q.8(a) Discuss good practices for designing line plots in R when displaying time-series data. 6

Q.8(b) Discuss mean, median, and mode as measures of central tendency. Use a small conceptual data set to support your explanation. 6

Q.9(a) Explain the steps involved in creating a histogram in R for a numeric variable stored in a data frame. Take a suitable example of your choice. 6

Q.9(b) What is a Box plot? How is it used to understand the distribution of the data? Explain. 6

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