

This question paper contains 3 printed pages]

**VI—06—2024**

**FACULTY OF SCIENCE AND TECHNOLOGY**

**BCA (Second Year) (Fourth Semester) EXAMINATION**

**NOVEMBER/DECEMBER, 2024**

**(CBCS/Revised Pattern)**

**COMPUTER APPLICATIONS**

**(Computer Graphics)**

**(Wednesday, 27-11-2024)**

**Time : 2.00 p.m. to 5.00 p.m.**

*Time—3 Hours*

*Maximum Marks—75*

**N.B. :—** (i) All questions are compulsory.

(ii) Figures to the right indicate full marks.

(iii) Assume suitable data, if required.

(iv) Use of any electronic media such as mobile phone, digital diary and electronic calculator is not permitted.

1. Attempt any *five* of the following (3 marks each) : 15

(a) What is Graphical user interface ? Explain.

(b) Explain scaling with example.

(c) Explain posting and unposting segments.

(d) Discuss working of Joystick.

(e) What is Cathode Ray Tube ? Explain.

P.T.O.

(f) Discuss Windowing function in brief.

(g) What is Reflection ? Explain.

2. Attempt any *three* of the following (5 marks each) : 15

(a) Explain the working of Color CRT monitors in brief.

(b) What is Segment ? Explain Segment naming scheme.

(c) Explain end point codes in brief.

(d) Explain Polygon clipping algorithm in brief.

(e) Discuss Viewing transformation in brief.

3. Attempt any *three* of the following (5 marks each) : 15

(a) Explain Bresenham's line algorithm with example.

(b) Explain translation with example.

(c) What is Plotter ? Explain in brief.

(d) Explain Midpoint subdivision algorithm in brief.

(e) Discuss ground rules for graphics s/w design.

4. Attempt any *three* of the following (5 marks each) : 15

(a) What is Computer Graphics ? Explain advantages of computer graphics.

(b) What are Graphics primitives ? Explain.

(c) Explain functions for segmenting display file in brief.

- (d) Explain Digital Differential Algorithm in brief.
- (e) What is Clipping ? Explain 2D clipping in brief.
5. Write short notes on any *three* of the following (5 marks each) : 15
- (a) Line and Line Segment
- (b) Application areas of Computer Graphics
- (c) Light Pen
- (d) Segment table
- (e) Geometric modeling.

This question paper contains 3 printed pages]

**VI—19—2024**

**FACULTY OF SCIENCE AND TECHNOLOGY**

**BCA (Second Year) (Fourth Semester) EXAMINATION**

**NOVEMBER/DECEMBER, 2024**

**(CBCS/Revised Pattern)**

**COMPUTER APPLICATION**

**Paper-BCA-402**

**(Data Structure and Algorithms)**

**(Monday, 2-12-2024)**

**Time : 2.00 p.m. to 5.00 p.m.**

*Time—3 Hours*

*Maximum Marks—75*

**N.B. :—** (i) All questions are compulsory.

(ii) Figures to the right indicate full marks.

(iii) Assume suitable data, if required.

1. Attempt any *five* of the following (3 marks each) : 15

(a) Elementary data organization.

(b) POP operation.

(c) Linear array.

(d) Recursion.

(e) D-Queue.

P.T.O.

(f) Threads.

(g) Insertion sort.

2. Attempt any *three* of the following (5 marks each) : 15

(a) Explain basic terminology of data structure.

(b) Explain Data structure operation.

(c) Explain Algorithm complexity.

(d) Explain in detail the concept of algorithm.

(e) What is array ? Explain array representation in detail.

3. Attempt any *three* of the following (5 marks each) : 15

(a) Explain Selection Sort with algorithm.

(b) Explain the representation of linked list in memory.

(c) Explain Memory allocation in brief.

(d) Explain insertion in linked list.

(e) Explain Stack.

4. Attempt any *three* of the following (5 marks each) : 15

(a) Explain Array representation of stack.

(b) Explain Deletion operation in Queue.

(c) Explain Memory Representation of Queue.

WT

( 3 )

VI—19—2024

- (d) Explain Priority Queue.
- (e) Explain Header Nodes in brief.

5. Write short notes on any *three* of the following (5 marks each) : 15

- (a) Explain terminology of Binary tree.
- (b) Explain Arithmetic expression.
- (c) Explain Traversing of binary tree.
- (d) Explain types of binary tree.
- (e) Explain General Tree Introduction.

VI—19—2024

This question paper contains 4 printed pages]

**VI—05—2024**

**FACULTY OF SCIENCE AND TECHNOLOGY**

**BCA (Second Year) (Fourth Semester) EXAMINATION**

**NOVEMBER/DECEMBER, 2024**

**(CBCS/Revised Pattern)**

**COMPUTER APPLICATION**

**Paper-404-A**

**(Operational Research)**

**(Wednesday, 27-11-2024)**

**Time : 2.00 p.m. to 5.00 p.m.**

*Time—3 Hours*

*Maximum Marks—75*

**N.B. :—** (i) All questions are compulsory.

(ii) Figures to the right indicate full marks.

(iii) Assume suitable data, if required.

(iv) Only non-programmable calculator is allowed.

(v) Only those graph papers are allowed, which is provided by exam centre.

1. Attempt any *five* of the following :

15

(a) Describe path in network analysis.

(b) Describe independent float.

(c) Describe applications of LPP.

P.T.O.

- (d) Explain maximum likelihood criteria.
- (e) Explain savage decision criteria.
- (f) Explain role of operation research.
- (g) Explain slack time.

2. Attempt any *three* of the following :

15

- (a) Explain critical activity.
- (b) Describe critical path method.
- (c) Explain network technique.
- (d) Explain development of operations.
- (e) Use graphical method to Maximize  $P = 6x + 4y$

Subject to restrictions  $2x + 3y \leq 120$

$$2x + y \leq 60$$

and  $x \geq 0, y \geq 0$

3. Attempt any *three* of the following :

15

- (a) Describe looping in network analysis.
- (b) Explain assumptions of LPP.
- (c) Describe non-negativity restrictions in graphical method of LPP.
- (d) Using graphical method, Minimize  $C = 15x + 25y$ .



WT

( 3 )

VI—05—2024

Subject to :

$$x \geq 1$$

$$y \geq 120$$

$$x + 30 \geq 110$$

$$x \geq 0; y \geq 0$$

(e) Construct first simplex table to Maximize  $Z = 4x + 10y$

Subject to restrictions  $2x + y \leq 10$

$$2x + 5y \leq 20$$

$$2x + 3y \leq 18$$

and  $x \geq 0, y \geq 0$

4. Attempt any *three* of the following :

15

(a) Explain max-min decision criteria.

(b) Describe Fulkerson's rule.

(c) Explain independent float.

(d) A shopkeeper has the following probabilities of selling a product :

No. of units sold	20	21	22	23	24
Probability	0.15	0.15	0.25	0.25	0.20

Cost of unit of product is ₹ 350 and sale price is ₹ 400. He cannot return unsold unit of product. How many units of product should be ordered.

(e) Explain project in network analysis.

P.T.O.

5. Attempt any *three* of the following :

15

- (a) Explain subcritical path.
- (b) Describe node in network analysis.
- (c) Explain importance of network technique in project management :
- (d) Construct network of the utility data for a network are given below :

Activity	0-1	1-2	1-3	2-4	2-5	3-4	3-6	4-7	5-7	6-7
Duration (weeks)	2	8	10	6	3	3	7	5	2	8

- (e) Determine the total, free, independent, interfering floats and identify the critical path for the data given in Q. 5 (d).

This question paper contains 3 printed pages]

**VI—12—2024**

**FACULTY OF COMPUTER SCIENCE**

**B.C.A. (Second Year) (Fourth Semester) EXAMINATION**

**NOVEMBER/DECEMBER, 2024**

**(CBCS/Revised Pattern)**

**COMPUTER SCIENCE**

**Paper-BCA-401**

**(Programming in Java)**

**(Friday, 29-11-2024)**

**Time : 2.00 p.m. to 5.00 p.m.**

*Time—3 Hours*

*Maximum Marks—75*

**N.B. :—** (i) All questions are compulsory.

(ii) Figures to the right indicate full marks.

(iii) Assume suitable data, if required.

1. Attempt any *five* of the following (3 marks each) :

15

(a) Explain JVM in short.

(b) What is Applet and how to create Applet ?

(c) Explain the use of “THIS” keyword in Java.

(d) Explain the Final Variable and Final Class.

(e) Discuss the history of Java.

P.T.O.

- (f) What are the Java features ?
- (g) Explain the Java Programming Structure.
2. Attempt any *three* of the following (5 marks each) : 15
- (a) Explain how Java differs from C++.
- (b) Discuss the Applet life cycle.
- (c) Explain multiple catch statement in detail.
- (d) What is static and non-static method ?
- (e) Explain string buffer class.
3. Attempt any *three* of the following (5 marks each) : 15
- (a) What are the types of stream class ?
- (b) Explain how to define and implement interface.
- (c) Explain string class in detail.
- (d) Discuss how to create user defined exception.
- (e) What is inheritance ? Explain any *two* types.
4. Attempt any *three* of the following (5 marks each) : 15
- (a) Explain Byte stream class in detail.
- (b) Explain how to create and access Package.
- (c) Explain nested if-else statement in JAVA.

- (d) Explain in detail method overriding with example.
  - (e) Explain in detail finalizer method with example.
5. Write short notes on any *three* of the following (5 marks each) : 15
- (a) Explain in detail method with example.
  - (b) Explain looping statement in detail.
  - (c) What is data type ? Explain its types.
  - (d) Explain Jumping statement in detail.
  - (e) Explain in detail passing parameters to Applets.

This question paper contains 3 printed pages]

**VI—29—2024**

**FACULTY OF SCIENCE AND TECHNOLOGY**

**BCA (Second Year) (Fourth Semester) EXAMINATION**

**NOVEMBER/DECEMBER, 2024**

**(CBCS/Revised Pattern)**

**COMPUTER APPLICATION**

**Paper-BCA-403**

**(Relational Database Management System)**

**(Thursday, 05-12-2024)**

**Time : 2.00 p.m. to 5.00 p.m.**

*Time—3 Hours*

*Maximum Marks—75*

**N.B. :—** (i) All questions are compulsory.

(ii) Figures to the right indicate full marks.

(iii) Assume suitable data, if necessary.

1. Attempt any *five* of the following (3 marks each) :

15

(a) TCL.

(b) Single Row Conversion.

(c) Foreign Key.

(d) Cross Join.

(e) Sorting.

(f) Views.

(g) Subqueries.

P.T.O.

2. Attempt any *three* of the following (5 marks each) : 15
- (a) Explain applications of RDBMS.
  - (b) Explain the advantages of RDBMS.
  - (c) Explain the characteristics of RDBMS.
  - (d) Explain Object Oriented Data Models in detail.
  - (e) Explain Mapping ER Model to Relational Mode.
3. Attempt any *three* of the following (5 marks each) : 15
- (a) What is SQL ? Explain SQL Commands.
  - (b) Explain Data types in SQL.
  - (c) Explain Data Constraints in brief.
  - (d) Explain how to manipulate data in table.
  - (e) Explain Entity Relationship.
4. Attempt any *three* of the following (5 marks each) : 15
- (a) What is operator ? Explain operators in detail.
  - (b) Explain SQL functions in detail.
  - (c) Explain Multiple row functions.
  - (d) What is Sorting ? Explain order by.
  - (e) Explain the types of Subqueries.

5. Write short notes on any *three* of the following (5 marks each) : 15

- (a) Explain Views.
- (b) Explain Join and its types.
- (c) Discuss altering table structure.
- (d) Explain Distinct.
- (e) Explain the Declaration section in PL/SQL.