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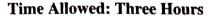
B.C.A. (Part-III) Examination – 2024

(Faculty of Science)

(Three-Year Scheme of 10+2+3 Pattern)

Paper-301/331 DS

Data Structure (Using C/C++)

Time Allowed: Three Hours　　　　　　　　　　　　**Maximum Marks: 100**

Answer of all the questions (Short answer as well as descriptive) are to be given in the main answer-book only. Answers of short answer type questions must be given in sequential order. Similarly all the parts of one question of descriptive part should be answered at one place in the answer-book. One complete question should not be answered at different places in the answer-book.

Write your roll number on question paper before start writing answers of questions.

*Question paper consists of **three** parts. **All three** parts are **compulsory**.*

***PART - I : (Very short answer)** consists of 10 questions of 2 marks each. Maximum limit for each question is up to 40 words.*

***PART - II : (Short answer)** consists of 5 questions of 4 marks each. Maximum limit for each question is up to 80 words.*

***PART - III : (Long answer)** consists of 5 questions of 12 marks each with one question from each unit with internal choice.*

PART-I

1.　**Very Short Answer -**　　　　　　　　　　　　　　　　**[10×2=20]**

(a)　What is the need for an algorithm?

(b)　Mention any two application areas of queue.

(c)　How will you represent a linked list in a graphical view?

(d)　What is the main advantage of a linked list?

(e)　Differentiate between root node and leaf node?

(f)　Briefly explain the concept of tree traversal.

(g)　Differentiate between directed and undirected graph?

(h)　What is transitive closure in reference to a graph structure?

(i)　Which sorting algorithm has the best time complexity and why?

(j)　What is the purpose of searching?

PART-II

2. **Short Answer -** [5×4=20]

(a) Discuss the characteristics of an algorithm.

(b) Explain operations of a stack using linked list with an example.

(c) Explain insertion and deletion operation on a binary search tree with the help of an example.

(d) Differentiate between Depth First Search and Breadth First Search with suitable examples.

(e) Explain the working of merge sort on the following data –

12 31 25 8 32 17 40 42

PART-III

3. Give a detailed explanation of implementation of two-dimensional array with all the operations using C/C++. Also discuss its operations. [7+5=12]

OR

Discuss in detail the following operation on a circular queue using array - [3+3+3+3=12]

(a) enQueue()

(b) deQueue()

(c) isFull()

(d) isEmpty()

4. Write a code for insertion of a node in doubly linked list in the following position [4+4+4=12]
(using C/C++) -

(a) At the beginning (Start)

(b) In between two Existing Nodes (Middle)

(c) At the End

OR

Write short notes on the following - [4+4+4=12]

(a) Application areas of Linked List

(b) Linked List versus Arrays

(c) Traversing a Linked List

5. What is the use of a binary tree? Given the following inorder and preorder traversal reconstruct a binary tree - [2+10=12]

Inorder – D, G, B, E, A, F, I, C

Preorder – A, B, D, E, H, C, F, I

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OR

Explain the following - **[3+3+3+3=12]**

   (a)   Full Binary Tree

   (b)   Complete Binary Tree

   (c)   Perfect Binary Tree

   (d)   Balanced Binary Tree

6. Discuss the representation of graph using the following - **[6+6=12]**

   (a)   Adjacency Matrix

   (b)   Adjacency List

OR

Write notes on the following - **[6+6=12]**

   (a)   Application areas of graph

   (b)   Shortest Path

7. Discuss quick sort. Write a C/C++ Program for quick sort on a list of N integers. **[6+6=12]**

OR

Differentiate between linear search and binary search with the help of an example. **[6+6=12]**

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B.C.A. (Part-III) Examination – 2024
(Faculty of Science)

(Three-Year Scheme of 10+2+3 Pattern)

Paper-302/332
System Design Concepts

Time Allowed: Three Hours **Maximum Marks: 100**

Answers of all the questions (short as well as are to be given in the main answer-book only. Answers of short answer type questions must be given in sequential order. Similarly all the parts of one question of descriptive part should be answered at one place in the answer-book. One complete question should not be answered at different places in the answer-book.

Write your roll number on question paper before start writing answers of questions.

Question paper consists of three parts. All three parts are compulsory.

PART-I: (Very short answer) consists of 10 questions of 2 marks each. Maximum limit for each question is up to 40 words.

PART-II: (Short answer) consists of 5 questions of 4 marks each. Maximum limit for each question is up to 80 words.

PART-III: (Long answer) consists of 5 questions of 12 marks each with one question from each unit with internal choice.

PART-I

1. **Very Short Answer Type Questions -** [10×2=20]

   (a) What do you mean by Function oriented system development approach?

   (b) What is prototyping?

   (c) What do you mean by Data Modelling?

   (d) What is the relationship degree in an E-R Diagram?

   (e) What do you mean by a test case?

   (f) What is Verification and Validation?

   (g) What is Software Project Planning?

   (h) What do you mean by Process-based estimation?

   (i) What is a formal system?

   (j) What do you mean by evaluation of a system?

PART-II

2. (a) Explain any one data gathering technique.   [5×4=20]

(b) Explain the different components of an ER Diagram.

(c) Explain the purpose of Documentation and Maintenance in a software development process.

(d) State the objectives of software project planning.

(e) Explain briefly the different levels of Management System.

PART-III   [5×12=60]

3. Explain the different phases of System Development Life Cycle.

OR

Explain the following Models -

(a) Waterfall Model

(b) Spiral Model

4. What is DFD? State and explain its Notations. Draw Level-1 and Level-2 DFDs for an Online Banking System.

OR

Write notes on -

(a) Decision Tree

(b) Structured English

5. Explain the objectives and Principles of Testing.

OR

Write notes on -

(a) Black-box Texting

(b) System Testing

6. What is COCOMO? Explain COCOMO Model with diagram.

OR

State and explain the Software Design Principles and Objectives.

7. What is MIS? Explain the benefits and components of MIS.

OR

Write notes on -

(a) Pifalls of MIS

(b) Structured and Unstructured Decision

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B.C.A. Part-III Examination – 2024

303/333

(Faculty of Science)

(Three Year Scheme of 10+2+3 Pattern)

Networking Technologies

Time Allowed: Three Hours   **Maximum Marks: 100**

Answer of all the questions (short answer as well as descriptive) are to be given in the main answer-book only. Answer of short answer type questions must be given in sequential order. Similarly all the parts of one question of descriptive part should be answered at one place in the answer-book. One complete question should not be answered at different places in the answer-book.

Write your roll number on question paper before start writing answers of questions.

*Question paper consists of **three** parts.*

All three** parts are **compulsory.

***PART-I:** (**Very short answer**) consists of 10 questions of 2 marks each. Maximum limit for each question is up to 40 words.*

***PART-II:** (**Short answer**) consists of 5 questions of 4 marks each. Maximum limit for each question is up to 80 words.*

***PART-III:** (**Long answer**) consists of 5 questions of 12 marks each with one question from each unit with internal choice.*

PART-I

1.   Attempt all questions. Each question carries 2 marks.   [10×2=20]

    (a) What is Protocol?

    (b) What are the key design issues of a Computer Network?

    (c) What is Routing?

    (d) What do you understand by Bandwidth?

    (e) Explain FTP?

    (f) Define Telnet.

    (g) What do you understand by x.25?

    (h) Define Multiplexing.

    (i) Explain Microwave Communication.

    (j) Define Geosynchronous Satellites.

PART-II

2.   (a) Explain mesh topology with suitable diagram.   [4]

     (b) Explain working of bridges.   [4]

     (c) Explain DNS.   [4]

     (d) Explain synchronous and asynchronous transmission.   [4]

     (e) Describe advantages of optical fiber cable.   [4]

PART-III

3.   Explain different transmission modes.   [12]

OR

(a) Give difference between LAN, MAN and WAN.   [6]

(b) What do you understand by network topology? Explain its types in detail.   [6]

4.   What are the responsibilities of Data link layer and network layer in OSI Model?   [12]

OR

Explain the following: [6×2=12]

(a) Wireless Transmission

(b) Error Correction

5.   Explain different layers of TCP/IP model.   [12]

OR

What is SNMP? Explain the three elements of SNMP.   [12]

6.   What do you understand by multiplexing? Explain different types of multiplexing.   [12]

OR

Difference between Packet and Circuit switching.   [12]

7.   Explain SONET in detail with neat diagram.   [12]

OR

What do you understand by ISDN? Explain different ISDN channels.   [12]

B.C.A. (Part-III) Examination – 2024

(Faculty of Science)
(Three-Year Scheme of 10+2+3 Pattern)
304/334 – Core Java Programming

Time Allowed: Three Hours   **Maximum Marks: 100**

Answer of all the questions (short answer as well as descriptive) are to be given in main answer book only. Answer of short answer type questions must be given in sequential order. Similarly all the parts of one question of descriptive part should be answered at one place in the answer-book. One complete question should not be answered at different places in the answer-book.

Write your roll number on question-paper before start writing answers of questions.

Question paper consists of **three** parts.

All **three** parts are **compulsory**.

PART-I: (Very short answer) consists 10 questions of 2 marks each, Maximum limit for each question is up to 40 words.

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PART-III: (Long answer) consists of 5 questions of 12 marks each with one question from each unit with internal choice.

PART-1

Q.1 Why Java is portable programming language?

Q.2 Write Syntax and working of ternary operator?

Q.3 What is Error and Exceptions in Java?

Q.4 What is String and StringBuffer class?

Q.5 What is event Driven Mechanism in Java?

Q.6 Difference between Java AWT and Java Swing Package?

Q.7 What is Applet in Java?

Q.8 What is the Runnable interface in Java?

Q.9 What is socket base connectivity in Java?

Q.10 What is ArrayList in Java?

PART-2

Q.1 Explain any four Object Oriented Concepts of Java.

Q.2 List out Java Control Statements. Explain working any two Control Statement with Syntax.

Q.3 Describe the two layout managers available in Java AWT for designing GUIs.

Q.4 Explain the life cycle of an Applet in Java.

Q.5 What is the purpose of the URL class in Java? Explain its primary functionalities.

PART-3

Q.1 (a) What are the main features of Java that contribute to its popularity as a programming language?

(b) Create a Java program that prompts the user to enter two integers. Then, determine whether both numbers are even, old or mixed (one even and one odd) using logical operators.

OR

Write a Java program that calculates and prints the maximum of three numbers entered by the user using the conditional (ternary) operator.

Q.2 (a) Define a class "Rectangle" with attributes length and width. Implement methods to calculate the area and perimeter of the rectangle.

(b) What is interfaces in Java? How do interfaces differ from classes?

OR

(a) Describe the concept of exception handling in Java. Explain the difference between checked and unchecked exceptions and provide examples if each.

(b) How does Java help to organize and manage classes?

Q.3 Explain with an example how you can implement an event-driven mechanism in Java using ActionListener.

OR

(a) Explain basic geometric shapes or elements that can be drawn using Graphical User Interface (GUI).

(b) Explain UI components available in Java AWT for creating graphical user interfaces.

Q.4 Explain all the methods for managing threads in Java.

OR

Explain techniques for achieving thread synchronization and facilitating inter-thread communication in Java.

Q.5 Explain and differentiate sockets, server sockets and datagram sockets in Java networking.

OR

Explain in detail the hierarchy of the Collection class in Java.

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B.C.A. (Part-III) Examination – 2024

(Faculty of Science)

(Three-Year Scheme of 10+2+3 Pattern)

305/335 – E- Commerce

Time Allowed: Three Hours   **Maximum Marks: 100**

Answer of all the questions (short answer as well as descriptive) are to be given in main answer-book only. Answers of short answer type questions must be given in sequential order. Similarly all the parts of one question of descriptive part should be answered at one place in the answer-book. One complete question should not be answered at different places in the answer-book.

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PART-I: (Very short answer) *consists of 10 questions of 2 marks each. Maximum limit for each question is up to 40 words.*

PART-II: (Short answer) *consists of 5 questions of 4 marks each. Maximum limit for each question is up to 80 words.*

PART-III: (Long answer) *consists of 5 questions of 12 marks each with one question from each unit with internal choice.*

Q.1   Attempt all questions:-

(1) Define E-Commerce.

(2) What is CRM?

(3) What is meant by Testing?

(4) What do you mean by the term "Validation"?

(5) Define E-Cash.

(6) Define the term "Cyber Law".

(7) What do you mean by Website?

(8) What do you understand by Operation Risk?

(9) What is E-Wallet?

(10) What is full form of OTP.

Q.2 Attempt all Questions.

(a) Explain Value Chain Integration.

(b) What is testing the System? Explain.

(c) Explain the types of E-Payment System.

(d) Explain the main transaction website components.

(e) Explain Security issues of M-Commerce.

Q.3 What is E-Commerce? Explain the scope and impact of E-Commerce.

OR

What is EDI? Explain the issues and benefits of EDI.

Q.4 What is Testing? What are the objectives of Testing? Explain the Functional Testing of E-Commerce.

OR

What is implementation in E-Commerce? Explain the steps in E-Commerce implementation.

Q.5 What do you mean by Credit card? Write different business pros and cons of credit card based payment.

OR

How would you secure Credit Card Payment System on your website? Explain in detail.

Q.6 What is E-Banking? Explain the main components of E-Banking.

OR

Define E-Banking? What are the common risks of E-Banking? Explain.

Q.7 What do you mean by M-Commerce? Explain the components included in system structure.

OR

Explain M-Commerce. What are the Security issues of M-Commerce? Explain.

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B.C.A. (Part-III) Examination – 2024

(Faculty of Science)

(Three-Year Scheme of 10+2+3 Pattern)

306/336 (B)

Advance Technologies of Programming Through PHP

Time Allowed: Three Hours   **Maximum Marks: 100**

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***PART-III:** (Long answer) consists of 5 questions of 12 marks each with one question from each unit with internal choice.*

PART-I   [10×2=20]

1. (i) What is PHP?

    (ii) What are superglobal variables in PHP?

    (iii) How can a text be printed using PHP?

    (iv) Name the Entry Control Loop in PHP.

    (v) What will be the result of combining a string with another data type in PHP?

    (vi) How to define a function in PHP?

    (vii) What is the difference GET and POST methods?

    (viii) What is the difference between runtime exception and compile time exception?

    (ix) How can we Create A Database Using PHP And MySQL?

    (x) Which method is responsible for sending the query to the database?

2. (i) What are constants in PHP, and what is the syntax to define them?

(ii) Which PHP function inserts an element to the end of an array by short example?

(iii) What is the difference between single quoted string and double quoted string?

(iv) What are the differences between a session and a cookie?

(v) How can you open a file in PHP?

PART-III

Unit-I

3. Differentiate between Server Side Vs Client Side Scripting. Explain the features of PHP. [12]

OR

Describe the various data types used in PHP with example. [12]

Unit-II

4. Discuss the conditional statements of PHP using examples. [12]

OR

Define an Array? Explain about the types of Arrays in PHP with an example. [12]

Unit-III

5. Explain the pre-defined and user defined functions in PHP using example. [12]

OR

Explain the syntax and usage of any three string functions in PHP. [12]

Unit-IV

6. What is Session? Write PHP code to show all the session variable values for a user session. [12]

OR

What are cookies? How can you create, access and delete a-cookie in PHP with the help of example. [12]

Unit-V

7. Discuss the usage of MySQL commands in PHP with example. [12]

OR

Describe the file handling mechanism in PHP in detail. [12]