II SEMESTER BCA(AI) EXAMINATION - MAY/JUNE 2026

SCHEME: Revised CBCS

031

BCA (Artificial Intelligence)

Data Structures using Python

Time: 3 Hours **Max. Marks: 80**

Instructions to Candidate: Answer both Part-A and Part-B.

PART - A

1. **Answer ALL the questions.** 8x2=16

   a. List the four pillars of OOP. CO1 LL1

   b. Define abstraction. CO1 LL1

   c. Mention any two non-primitive data structures. CO2 LL1

   d. What is linked list? CO2 LL1

   e. Write the formula to find mid element in binary search. CO3 LL1

   f. Define quick sort. CO3 LL1

   g. What are weighted and unweighted graphs? CO4 LL1

   h. Define Binary Search Tree. CO4 LL1

PART – B

Answer any TWO questions from each main. 4x16=64

2. a) i) Explain constructors and their types with syntax and examples. CO1 LL2 6

   ii) List the types of Methods in OOP. CO1 LL2 2

   b) Explain the concept of inheritance and its different types with suitable examples. CO1 LL2

   c) Explain Abstraction with syntax and example. CO1 LL2

   d) What is an array? Explain types of arrays with examples. CO1 LL2

3. a) Explain the following: CO2 LL2

   i) List

   ii) Tuples

   iii) Set

   iv) Dictionaries

PTO

	b)	What is a string in python? Explain any six string methods with examples.	CO2 LL2	
	c)	Explain the insertion operations in a singly linked list. Write a program to implement these insertion operations.	CO2 LL2	
	d)	Write a program to implement a stack using a list and a linked list.	CO2 LL2	
4.	a)	i) What is searching? List the types of searching algorithms.	CO3 LL2	4
		ii) Compare linear search and binary search.	CO3 LL2	4
	b)	What is binary search? Write programs to implement it using iterative and recursive approaches.	CO3 LL2	
	c)	What is merge sort? Explain its working with algorithm and suitable example.	CO3 LL2	
	d)	i) Explain queue operations.	CO3 LL2	4
		ii) Write a program to implementation of queue using linked list.	CO3 LL2	4
5.	a)	i) Define a graph. Write any four differences between directed and undirected graphs.	CO4 LL2	6
		ii) What are complete and multi graphs?	CO4 LL2	2
	b)	Explain the graph traversal techniques. Illustrate both BFS and DFS with suitable examples.	CO4 LL2	
	c)	Explain classification of binary tree with example.	CO4 LL2	
	d)	Explain different AVL tree rotations with diagrams.	CO4 LL2	

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