

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)
BCA DEGREE EXAMINATION MAY 2026
(Second Semester)
Branch – **COMPUTER APPLICATIONS**
DATA STRUCTURES & ALGORITHMS

Time: Three Hours

Maximum: 75 Marks

SECTION-A (10 Marks)

Answer **ALL** questions

ALL questions carry **EQUAL** marks

(10 × 1 = 10)

Module No.	Question No.	Question	K Level	CO
1	1	Time complexity mainly measures _____ (i) Memory usage (ii) Execution time (iii) Program size (iv) Disk Space	K1	CO1
	2	Which data structure stores elements in contiguous memory locations? (i) Linked List (ii) Stack (iii) Array (iv) Tree	K2	CO1
2	3	Which searching method uses a hash table? (i) Linear Search (ii) Binary Search (iii) Hashing (iv) Radix Search	K1	CO2
	4	What is the main advantage of Hashing in searching? (i) Works only on sorted data (ii) Provides fast data access (iii) Uses less memory (iv) Avoids collisions	K2	CO2
3	5	In a singly linked list, each node contains _____ (i) Only data (ii) Only pointer (iii) Data and two pointers (iv) Data and one pointer	K1	CO3
	6	During deletion in a linked list, which of the following must be updated? (i) Pointers (ii) Only memory (iii) Only data (iv) Index	K2	CO3
4	7	Identify the principle followed by a stack (i) FIFO (ii) LIFO (iii) LILO (iv) FILO	K1	CO4
	8	In postfix expression, operators are placed _____ (i) Before operands (ii) Between operands (iii) After operands (iv) Randomly	K2	CO4
5	9	In which traversal is the root visited first? (i) In-order (ii) Preorder (iii) Post-order (iv) Level order	K1	CO5
	10	The height of an AVL tree is _____ (i) O(n) (ii) O(log n) (iii) O(n ²) (iv) O(1)	K2	CO5

Cont...

SECTION - B (35 Marks)Answer **ALL** questions**ALL** questions carry **EQUAL** Marks

(5 × 7 = 35)

Module No.	Question No.	Question	K Level	CO
1	11.a.	Describe the structure and components of an array.	K2	CO1
		(OR)		
	11.b.	Illustrate basic string processing operations with examples.		
2	12.a.	Explain the working principle of Bubble Sort with a suitable example.	K2	CO2
		(OR)		
	12.b.	Discuss the limitations of Binary Search.		
3	13.a.	Implement an algorithm to delete a specific element from a linked list.	K3	CO3
		(OR)		
	13.b.	Write and explain an algorithm to insert a node at a given position in a linked list.		
4	14.a.	Examine the advantages of circular queues over linear queues.	K4	CO4
		(OR)		
	14.b.	Differentiate infix, prefix, and postfix expressions with respect to evaluation.		
5	15.a.	Analyze the structure of a binary tree and explain how different traversal methods process nodes.	K4	CO5
		(OR)		
	15.b.	Break down the steps involved in finding the shortest path in a weighted graph.		

SECTION - C (30 Marks)Answer **ANY THREE** questions**ALL** questions carry **EQUAL** Marks

(3 × 10 = 30)

Module No.	Question No.	Question	K Level	CO
1	16	Summarize the applications of arrays, structures, and pointers in real-life programming.	K2	CO1
2	17	Compare Linear Search and Binary Search based on their methods.	K2	CO2
3	18	Apply the concept of dynamic memory allocation to create a singly linked list program.	K3	CO3
4	19	Analyze the causes of overflow and underflow in stacks and queues.	K4	CO4
5	20	Justify the use of shortest path algorithms in real-time navigation systems.	K5	CO5

Z-Z-Z

END