PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

BSc DEGREE EXAMINATION DECEMBER 2025
(Second Semester)

Branch - COMPUTER SCIENCE

DATA STRUCTURES AND 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	Which sorting algorithm has the best average-case complexity? a) Bubble Sort b) Quick Sort c) Selection Sort d) Insertion Sort	K1	CO1
	2	The space complexity of an algorithm refers to _____. a) Temporary variables used b) Input size c) Output size d) Execution time	K2	CO1
2	3	Which linked list allows traversal in both directions? a) Single Linked List b) Doubly Linked List c) Circular Linked List d) Array List	K1	CO2
	4	The postfix expression of (A+B)*C is_____. a) A B + C * b) A B C * + c) A + B * C d) A * B + C	K2	CO2
3	5	Which queue allows insertion and deletion at both ends? a) Circular queue b) Deque c) Priority queue d) Simple queue	K1	CO3
	6	Which queue gives highest priority to elements? a) Simple queue b) Circular queue c) Priority queue d) Deque	K2	CO3
4	7	Which algorithm is used to solve the shortest path problem? a) Kruskal's algorithm b) Dijkstra's algorithm c) Prim's algorithm d) Floyd's algorithm	K1	CO4
	8	Which algorithm is used in All-Pairs shortest path? a) Floyd-Warshall b) Dijkstra c) Bellman-Ford d) Kruskal	K2	CO4
5	9	Huffman coding is used in_____. a) Encryption b) Compression c) Searching d) Sorting	K1	CO5
	10	The Hamiltonian circuit problem is solved using _____. a) Backtracking b) Greedy c) Dynamic programming d) BFS	K2	CO5

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.	Identify the basic concept of sparse matrices with example.	K2	CO1
		(OR)		
	11.b.	Distinguish between the time and space complexity.		

Module No.	Question No.	Question	K Level	CO
2	12.a.	Explain the difference between binary search and sequential search.	K2	CO2
		(OR)		
	12.b.	Illustrate the various operations on stack with example.		
3	13.a.	Summarize the procedure for circular queue.	K4	CO3
		(OR)		
	13.b.	Evaluate the concept of AVL search trees with example.		
4	14.a.	Discuss the need of asymptotic notations with example.	K3	CO4
		(OR)		
	14.b.	Assume the purpose of Warshall's algorithm in dynamic programming.		
5	15.a.	Determine the use of Kruskal's algorithm in greedy method.	K5	CO5
		(OR)		
	15.b.	Estimate the algorithm for N-Queens problem in backtracking.		

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	Analyze the algorithm for quick sort with example.	K2	CO1
2	17	Enumerate the procedure for insertion and deletion operations on doubly linked list.	K2	CO2
3	18	Evaluate the insertion and deletion of nodes in binary search tree.	K6	CO3
4	19	Discover the implementation of travelling salesman problem.	K3	CO4
5	20	Elaborate the Hamiltonian circuit problem in backtracking.	K5	CO5

Z-Z-Z   END