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PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

BSc DEGREE EXAMINATION MAY 2024
(Second Semester)

Common to Branches – **INFORMATION TECHNOLOGY & COMPUTER TECHNOLOGY**

DATA STRUCTURES

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	In Big O notation, what does O(1) represent? a) Constant time b) Linear time c) Exponential time d) Quadratic time	K1	CO1
	2	What is the index of the first element in an array? a) 0 b) 1 c) -1 d) 2	K2	CO1
2	3	Which of the following is a comparison-based sorting algorithm? a) Radix sort b) Bubble sort c) Selection sort d) Merge sort	K1	CO2
	4	Which method is commonly used to handle collisions in hashing? a) Linear Probing b) Binary Search c) Quick Sort d) DFS Search	K2	CO2
3	5	The second part of the linked list is _____. (a) Node b) List (c) Link d) Data	K1	CO3
	6	Which of the following is not a common operation on a doubly linked list? a) Insertion b) Searching c) Deletion d) Sorting	K2	CO3
4	7	Which notation refers the operation symbol is places after its operands? a) Infix b) Prefix c) Postfix d)Polish	K1	CO4
	8	Which operation is used to add an element in the Queue? a) Push b) Pop c) Enqueue d) Dequeue	K2	CO4
5	9	What is the time complexity for searching in a balanced binary search tree (BST)? a) O(1) b) O(log N) c) O(N) d) $O(n^2)$	K1	CO5
	10	The _____ of the node is the number of edges from the root to the node. a) Path b) Vertex c) Depth d) Height	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.	Explain the implementation of array in data structure.	K5	CO1
		(OR)		
	11.b.	Interpret the concept of data structure in various applications with example.		
2	12.a.	Illustrate the selection sort with example.	K3	CO2
		(OR)		
	12.b.	Identify the workflow of linear search algorithm with example.		
3	13.a.	Summarize the dynamic memory allocation in data structure.	K3	CO3
		(OR)		
	13.b.	Explain the algorithm for deleting a linked list.		
4	14.a.	Enumerate the Towers of Hanoi problem.	K5	CO4
		(OR)		
	14.b.	Explain how a circular queue can be implemented in linked list.		
5	15.a.	What is heap sort? Discuss with example.	K6	CO5
		(OR)		
	15.b.	Elaborate the traversing operation in 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	Make use of matrices with example.	K3	CO1
2	17	Utilize the binary search algorithm in detail.	K3	CO2
3	18	Interpret the concept of doubly linked list with example.	K5	CO3
4	19	Explain the recursion concept with suitable example.	K5	CO4
5	20	Discuss the Warshall algorithm with example.	K6	CO5

Z-Z-Z END