Reg. No. | | | | | | | | |

G. VENKATASWAMY NAIDU COLLEGE (AUTONOMOUS), KOVILPATTI – 628 502.

UG DEGREE END SEMESTER EXAMINATIONS - NOVEMBER 2025.

(For those admitted in June 2023 and later)

PROGRAMME AND BRANCH: B.C.A.

SEM	CATEGORY	COMPONENT	COURSE CODE	COURSE TITLE
III	PART - III	CORE - 5	U23CA303	DATA STRUCTURES AND ALGORITHMS

Date & Session:07.11.2025/AN **Time : 3 hours** **Maximum: 75 Marks**

Course Outcome	Bloom's K-level	Q. No.	**SECTION – A (10 X 1 = 10 Marks)** **Answer ALL Questions.**
CO1	K1	1.	_____ linked list contains a pointer to the next as well as the previous node in the sequence. a) Singly b) Circular c) Doubly d) Singly Circular
CO1	K2	2.	Which type of linked list does not store NULL in next field? a) Singly linked list b) Circular linked list c) Doubly linked list d) All of these
CO2	K1	3.	The strategy followed by the stack is _____. a) LIFO b) FIFO c) FILO d) LILO
CO2	K2	4.	The circular queue will be full only when _____. a) FRONT = MAX –1 and REAR = Max –1 b) FRONT = 0 and REAR = Max –1 c) FRONT = MAX –1 and REAR = 0 d) FRONT = 0 and REAR
CO3	K1	5.	Pre-order traversal is also called _____. a) Depth first b) Breadth first c) Level order d) In-order
CO3	K2	6.	Degree of a leaf node is _____. a) 0 b) 1 c) 2 d) 3
CO4	K1	7.	A graph in which there exists a path between any two of its nodes is called _____. a) Complete graph b) Connected graph c) Digraph d) In-directed graph
CO4	K2	8.	How many articulation vertices does a biconnected graph contain? a) 0 b) 1 c) 2 d) 3
CO5	K1	9.	In which sorting, consecutive adjacent pairs of elements in the array are compared with each other? a) Bubble sort b) Selection sort c) Merge sort d) Radix sort
CO5	K2	10.	_____ is a data structure in which keys are mapped to array positions by a hash function. a) Hashing b) Hash table c) Probing d) Addressing
Course Outcome	**Bloom's K-level**	**Q. No.**	**SECTION – B (5 X 5 = 25 Marks)** **Answer ALL Questions choosing either (a) or (b)**
CO1	K3	11a.	Write a note on the array implementation of list. **(OR)**
CO1	K3	11b.	Discuss about the insertion in doubly linked list.

CO2	K3	12a.	Consider the queue given below which has FRONT = 1 and REAR = 5. A | B | C | D | E Perform the following operations and show the queue status: (a) Add F (b) Delete two letters (c) Add G (d) Add H (e)Add I **(OR)**
CO2	K3	12b.	Convert the infix expression (A + B) / (C + D) – (D * E) into its postfix form using stack ADT.
CO3	K4	13a.	Illustrate the structure of the Heap data structure. **(OR)**
CO3	K4	13b.	Inspect the binary tree ADT in detail.
CO4	K4	14a.	Comment on the types of graphs with neat diagram. **(OR)**
CO4	K4	14b.	Highlight the applications of graphs.
CO5	K5	15a.	Sort the elements 39, 9, 45, 63, 18, 81 using insertion sort and demonstrate the position of elements in each pass. **(OR)**
CO5	K5	15b.	Assess the importance of hashing.

Course Outcome	**Bloom's K-level**	**Q. No.**	**SECTION – C (5 X 8 = 40 Marks)** **Answer ALL Questions choosing either (a) or (b)**
CO1	K3	16a.	Outline the purpose and the benefits of the circular linked list. **(OR)**
CO1	K3	16b.	Write a code to create a singly linked list with five nodes.
CO2	K4	17a.	Summarize the operations of the stack ADT with suitable examples. **(OR)**
CO2	K4	17b.	Examine the working mechanism of the priority queue.
CO3	K4	18a.	Categorize the Binary Tree Traversal techniques. **(OR)**
CO3	K4	18b.	Analyze the features of the binary search tree.
CO4	K5	19a.	Compare and contrast the depth first and the breadth first search of a graph. **(OR)**
CO4	K5	19b.	Analyze the representations of graphs.
CO5	K5	20a.	Criticize the working process of the radix sort with appropriate illustrations. **(OR)**
CO5	K5	20b.	Justify the statement – "Binary Search will be efficient when the array elements are in the ascending order"