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



UG DEGREE END SEMESTER EXAMINATIONS - NOVEMBER 2024.

(For those admitted in June 2023 and later)

PROGRAMME AND BRANCH: B.Sc., INFORMATION TECHNOLOGY

SEM	CATEGORY	COMPONENT	COURSE CODE	COURSE TITLE
II	PART - III	ELECTIVE GENERIC - 2	U23IT2A2	DATA STRUCTURES

Date &amp; Session: 14.11.2024/ FN

Time : 3 hours

Maximum: 75 Marks

Course Outcome	Bloom's K-level	Q. No.	SECTION – A (10 X 1 = 10 Marks) Answer <u>ALL</u> Questions.
CO1	K1	1.	What is a data structure? a) A programming language b) A collection of algorithms c) A way to store and organize data d) A type of computer hardware
CO1	K2	2.	Which of the following data structure is non-linear type? a) Strings b) List c) Stacks d) None of the above
CO2	K1	3.	Which data structure is based on the Last In First Out (LIFO) principle? a) Tree b) Queue c) Linked List d) Stack
CO2	K2	4.	The data structure required to check whether an expression contains a balanced parenthesis is? a) Queue b) Stack c) Array d) Tree
CO3	K1	5.	Which algorithm is used in the top tree data structure? a) Backtracking b) Branch c) Divide and Conquer d) Greedy
CO3	K2	6.	The data structure required for Breadth First Traversal on a graph is? a) Queue b) Stack c) Array d) Tree
CO4	K1	7.	A pivot element to partition unsorted list is used in. a) Merge sort b) Quick sort c) Insertion Sort d) Selection sort
CO4	K2	8.	Which of the following sorting algorithms can be used to sort a random linked list with minimum time complexity? a) Insertion sort b) Merge sort c) Quick sort d) Heap sort
CO5	K1	9.	Given a plane graph, G having 2 connected components, having 6 vertices, 7 edges and 4 regions. What will be the number of connected components? a) 1 b) 2 c) 3 d) 4
CO5	K2	10.	A graph with all vertices having equal degree is known as a _____. a) Multi Graph b) Regular Graph c) Simple Graph d) Complete Graph

Course Outcome	Bloom's K-level	Q. No.	<b>SECTION - B (5 X 5 = 25 Marks)</b> <b>Answer ALL Questions choosing either (a) or (b)</b>
CO1	K3	11a.	Write the List abstract Data type. <b>(OR)</b>
CO1	K3	11b.	Narrate the steps in Linear search.
CO2	K3	12a.	Illustrate Stack Push operations. <b>(OR)</b>
CO2	K3	12b.	Compare the Stack and Queue operations.
CO3	K4	13a.	Define Binary Tree and its types. <b>(OR)</b>
CO3	K4	13b.	Discuss the Singly Linked list.
CO4	K4	14a.	Briefly explain Insertion sort. <b>(OR)</b>
CO4	K4	14b.	Evaluate Topological sort.
CO5	K5	15a.	Discuss Graph with its types. <b>(OR)</b>
CO5	K5	15b.	Examine the Greedy algorithm to find shortest path.

Course Outcome	Bloom's K-level	Q. No.	<b>SECTION - C (5 X 8 = 40 Marks)</b> <b>Answer ALL Questions choosing either (a) or (b)</b>
CO1	K3	16a.	Define Control structures with time complexity. <b>(OR)</b>
CO1	K3	16b.	Explain Binary search in detail.
CO2	K4	17a.	Discuss the Queue implantation of Singly Linked list. <b>(OR)</b>
CO2	K4	17b.	Write an algorithm to convert Infix to Postfix Expression. (steps and Diagram)
CO3	K4	18a.	Explain about Singly Linked list in detail. <b>(OR)</b>
CO3	K4	18b.	Evaluate the Tree Traversal techniques in detail.
CO4	K5	19a.	Discuss Bi-connectivity in detail. <b>(OR)</b>
CO4	K5	19b.	Examine the Shell sort in detail.
CO5	K5	20a.	Discuss Graph terminology. <b>(OR)</b>
CO5	K5	20b.	Implementation of Warshall's algorithm in shortest path.