Question Paper Code: R18A21CS02

R18

ANURAG Engineering College

(An Autonomous Institution)

II B.Tech I Semester Supplementary Examinations, December – 2024

DATA STRUCTURES

(COMPUTER SCIENCE AND ENGINEERING)

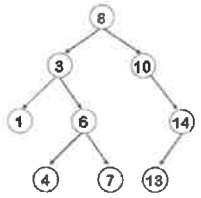
Time: 3 Hours **Max. Marks: 75**

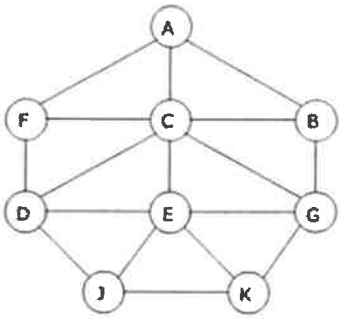
Section – A (Short Answer type questions) (25 Marks)

Answer All Questions	Course Outcome	B.T Level	Marks
1. Explain the classification of data structures with examples.	CO1	L2	2M
2. Explain in brief the different functions of dynamic memory allocation	CO1	L2	3M
3. Define Complete Binary Tree.	CO2	L1	2M
4. Define properties of Binary Tree.	CO2	L1	3M
5. What is a balancing factor in AVL tree.	CO3	L1	2M
6. List the properties of Red-Black Tree.	CO3	L1	3M
7. Explain adjacency matrix and adjacency list with suitable example.	CO4	L2	2M
8. What is a minimum cost spanning tree. Give an example for it.	CO4	L1	3M
9. What is internal sorting and external sorting?	CO5	L1	2M
10. Explain selection sort algorithm with example.	CO5	L2	3M

Section B (Essay Questions)

Answer all questions, each question carries equal marks. **(5 X 10M = 50M)**

		Course Outcome	B.T Level	Marks
11. A)	Write a function to convert the infix expression into postfix expression and convert the given infix expression into postfix expression: a+b*(c^d-e)^(f+g*h)-i	CO1	L3	10M
	OR			
B)	Develop a C program to perform operations on circular queue data structure.	CO1	L3	10M
12. A)	Write a recursive functions for tree traversals. Also find the tree  traversals for the given tree.	CO2	L3	10M
	OR			
B)	Define Threaded Binary Tree. Construct Threaded Binary Tree for the following elements: 45,35,40,38,60,55	CO2	L3	10M
13. A)	Define Binary Search tree and write an insertion function for Binary Search Tree. Construct a binary search tree (BST) for the following elements: 85,34,96,54,23,67,100,120,112	CO3	L3	10M
	OR			
B)	What is B+ tree. Write the properties of B+ tree. Construct B+ tree of order 3 for the following elements: 35,68,96,42,67,53,84,76,16,44,12,21,65,59.	CO3	L3	10M

14. A)	Write an algorithm for Depth First Search. Also traverse the given graph using DFS: 	CO4	L3	10M
	OR			
B)	Write and explain prim's algorithm with example.	CO4	L3	10M
15. A)	Write a C program to sort N elements using merge sort.	CO5	L3	10M
	OR			
B)	Define hashing. Explain different hashing functions with examples. Discuss the properties of a good hash function.	CO5	L2	10M