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Question Paper Code	12489
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B.E. / B.Tech. - DEGREE EXAMINATIONS, NOV / DEC 2023

Third Semester

Electronics and Instrumentation Engineering

(Common to Instrumentation and Control Engineering)

20ESIT301 - DATA STRUCTURES AND ALGORITHMS

(Regulations 2020)

Duration: 3 Hours

Max. Marks: 100

PART - A (10 × 2 = 20 Marks)

Answer ALL Questions

- | | <i>Marks,
K-Level, CO</i> |
|---|-------------------------------|
| 1. Evaluate the given postfix expression $9\ 3\ 4\ * \ 8\ + \ 4\ / \ -$ | <i>2,K2,CO1</i> |
| 2. State the applications of Queue. | <i>2,K1,CO1</i> |
| 3. How to display the elements in doubly linked list? | <i>2,K2,CO2</i> |
| 4. What is circular linked list? | <i>2,K1,CO2</i> |
| 5. Define threaded binary tree. | <i>2,K1,CO3</i> |
| 6. Mention the different types of tree traversals. | <i>2,K2,CO3</i> |
| 7. What are the two traversal strategies used in traversing a graph? | <i>2,K2,CO4</i> |
| 8. Define minimum cost spanning tree. | <i>2,K1,CO4</i> |
| 9. Define separate chaining. | <i>2,K1,CO6</i> |
| 10. What are the collision resolution methods? | <i>2,K1,CO6</i> |

PART - B (5 × 13 = 65 Marks)

Answer ALL Questions

11. a) Write an algorithm to perform various operations on stack with examples. *13,K2,CO1*

OR

- b) Explain the array implementation of queue ADT in detail. *13,K2,CO1*

12. a) Explain the insertion and deletion operation in singly linked list. *13,K2,CO2*

OR

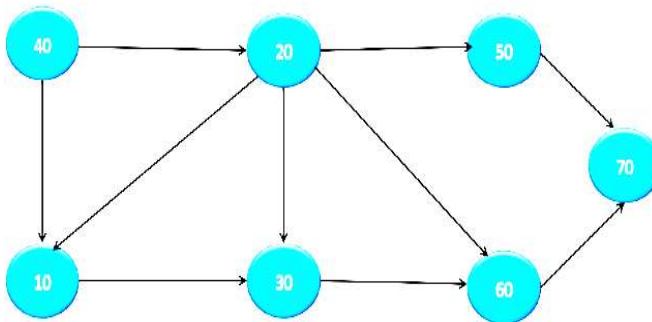
- b) With an example and explain how polynomial manipulations are performed with lists. *13,K2,CO2*

13. a) Create a binary search tree for the following numbers start from an empty binary search tree. 45,26,10,60,70,30,40 Delete keys 10, 60 and 45 one after the other and show the trees at each stage. 13,K3,CO3

OR

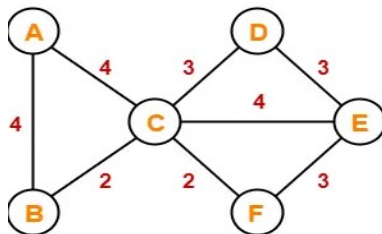
- b) Construct an expression tree for the expression $(a + b * c) + ((d * e + 1) * g)$ and perform Tree Traversals. 13,K3,CO3

14. a) Write and trace the BFS algorithms for the following Graph. 13,K3,CO4



OR

- b) Explain the Prim's Algorithm using the following Graph. 13,K3,CO4



15. a) Explain in detail about Rehashing technique with suitable example. 13,K2,CO6

OR

- b) Explain the concept of division method in hashing. Store the following values in a hash table of size: 11, Values: 25, 45, 96, 101, 102, 162, 197, 201. 13,K3,CO6

PART - C (1 × 15 = 15 Marks)

16. a) Write a C program to perform searching operations using linear and binary search. 15,K3,CO5

OR

- b) Write an algorithm to sort the following numbers using Insertion sort: 39,9,45,63,18,81,108,54,72,36. 15,K3,CO5