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P.E.S. College of Engineering, Mandya - 571 401

(An Autonomous Institution affiliated to VTU, Belagavi)

Third Semester, B.E. - Electrical and Electronics Engineering

Semester End Examination; Dec. - 2019

Data Structure with C

Time: 3 hrs *Max. Marks: 100*

***Note**: Answer **FIVE** full questions, selecting **ONE** full question from each unit.*

UNIT -I

1 a. Differentiate between Static and Dynamic Memory Allocation. Explain any one Dynamic Memory Allocation function with an example. 7

b. Differentiate between Structure and Union. 5

c. What is an algorithm? Explain main characteristics of an algorithm. Write an algorithm to swap two numbers. 8

2 a. With an example, explain two dimensional array. Write a C program. 8

b. What is data abstraction? Explain with an example. 6

c. Write a C program to illustrate quadratic polynomial. 6

UNIT - II

3 a. Write the Abstract Data Types of stack and illustrate Create, Push, Pop and Display an element in a stack. 10

b. Convert (a*b) + (c*d) into prefix expression and write C program. 10

4 a. Write the Abstract Data types of queue and illustrate Push and Pop operation. 10

b. With an example, illustrate multiple Queues and write a C program on multiple Queues. 10

UNIT - III

5 a. With a C program, explain Singly Linked List. 10

b. Explain the working of Stack operation in Linked lists. 10

6 a. What is Header node? With a C program, illustrate inserting a node and deleting a node and display the results. 10

b. Write a C program to perform the insert and delete to and from a node on Doubly Linked List and also list the advantages of Double Linked List. 10

UNIT - IV

7 a. Define the following terms by drawing a tree structure: 10

i) Tree ii) Leaf node iii) Internal node iv) External node

v) Height of a tree vi) Child node vii) Root viii) Degree

b. Explain Threaded Binary tree and Heaps. 10

Contd…2

8	a.	What is graph? List the ADT's of graph and discuss the each ADT in detail.	10
	b.	With a C program, explain Binary Search Tree.	10

UNIT - V

9	a.	What is an AVL Binary Search tree? Write an algorithm to display elements of AVL tree.	10
	b.	Explain red black tree and list the procedures and properties of red black tree to insert and delete an item.	10
10	a.	Explain Optimal Binary Search tree with an example.	10
	b.	What is splay tree? Advantages of splay tree over AVL and Red black tree and also classify different types of splay tree	10

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