U.S.N

P.E.S. College of Engineering, Mandya - 571 401
(An Autonomous Institution affiliated to VTU, Belgaum)
Third Semester, B.E. – Electrical and Electronics Engineering
Make-up Examination; Jan / Feb - 2017
Data Structures with C

Time: 3 hrs *Max. Marks: 100*

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

UNIT - I

1 a.	What is a Pointer? Explain the concept of Pointer.	10
b.	Explain polynomial representation. List its advantages and disadvantages.	10
2 a.	What is dynamic memory allocation? Explain how memory can be allocated using malloc( )?	10
b.	How structures are initialized? Differentiate between structure and union.	10

UNIT - II

3 a.	Define various abstract data types of stack. How to implement stacks using dynamic arrays.	10
b.	What is circular queue? Explain following circular queue functions : i) Create( ) ii) Delete( ) iii) Insert( ) iv) Display( ).	10
4 a.	What is an expression in stack? List the types of expressions. Write an algorithm to convert from infix to postfix expression.	10
b.	Define various ADT's of Queue. Write a C program to implement circular queue.	10

UNIT - III

5 a.	Explain how a chain can be used to implement a queue. Write the function to insert and delete elements from such a queue.	10
b.	Explain the following using suitable diagram : i) Circular List ii) Doubly Linked List.	10
6 a.	Write a C program to perform the operations on Queue, using the singly linked list.	10
b.	Enlist the advantages and disadvantages of Single Linked List (SLL) and Double Linked List (DLL).	10

UNIT - IV

7 a.	What is Tree? Explain how Tree can be represented using structure.	5
b.	Write a function to create binary search tree.	5
c.	Explain the following with an example : i) Forest ii) Graph iii) Winner Tree.	10

8 a. Define ADT of binary search tree. Write the iterative search function and recursive search function of BST.   10

b. Write short notes on :

i) Binomial heaps

ii) Priority heaps   10

iii) Fibonacci Heaps.

UNIT - V

9 a. What is an AVL Tree? Write the algorithm to insert an item into AVL tree.   10

b. Explain the following with an example :

i) Red-Black Tree   10

ii) Splay Tree.

10 a. What is optimal binary search tree? Obtain the same for the following items and associated priority.   10

Keys:	A	B	C	D
Probability:	0.1	0.2	0.4	0.3

b. Write the procedure to insert a node into a Red-Black tree? Create a Red-Black tree for the following sequence of item 10, 85, 15, 70, 20, 60, 30, 50, 65, 80, 90, 5.   10

✳ ✳ ✳