U.S.N

P.E.S. College of Engineering, Mandya - 571 401
(An Autonomous Institution affiliated to VTU, Belagavi)
Third Semester, B.E. - Computer Science and Engineering
Semester End Examination; Dec. - 2019
Data Structures

Time: 3 hrs   *Max. Marks: 100*

Note: i) PART - A is compulsory. **Two** marks for each question.
   ii) PART - B: Answer any **Two** sub questions (from a, b, c) for Maximum of **18 marks** from each unit.

Q. No.	Questions	Marks
	I : PART - A	**10**
I a.	What are pointer variables? How to declare and initialize pointer variable?	2
b.	What is a recursion? Write a recursive function to compute GCD of two numbers.	2
c.	What is the purpose of using calloc function? Write its syntax.	2
d.	What are the properties of a binary tree?	2
e.	What is address calculation sort? What are its properties?	2
	II : PART - B	**90**
	UNIT - I	**18**
1 a.	Write the C function for the following using pointers: i) Add two numbers using function ii) Program to return pointer to larger of two numbers	9
b.	Define data structures. Write a C program to evaluation of postfix expression.	9
c.	Define stack. Write a C-function which performs various operation of stack.	9
	UNIT - II	**18**
2 a.	What are Fibonacci numbers? Write a recursive function for, i) Fibonacci number ii) Tower of Hanoi	9
b.	What is a queue? What are the various operations that can be performed on queues? Explain with their functions.	9
c.	What is a circular queue? How it is different from an ordinary queue? Explain how a priority queue can be implemented?	9
	UNIT - III	**18**
3 a.	Explain the different memory allocation techniques in C.	9
b.	What is a linked list? Write a C-Program to implement queues using single linked list.	9
c.	Write a C program to add two polynomials.	9

UNIT - IV **18**

4 a. What is a tree? Explain the different ways of tree representation. 9

  b. What is threaded binary tree? Explain different types of threaded binary trees. 9

  c. What are BST? Explain binary tree traversal methods. 9

UNIT - V **18**

5 a. Write a C program to sort array element using address calculation sort. 9

  b. What are sentinel search? Write a C-Program to search an element in an array using sentinel search. 9

  c. What is Radix sort? Sort the following elements using radix sort:

  57, 45, 67, 91, 28, 79, 35, 68, 89, 20, 62, 43, 84, 55, 86, 96, 78, 25. 9

✻ ✻ ✻