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Code No: A10504

MLR15

MLR INSTITUTE OF TECHNOLOGY

(An Autonomous Institution)

I B.Tech II Semester advanced supplementary/improvement Examinations- July-2016

DATA STRUCTURES

(Common to ECE, CSE, IT & AERO)

Time: 3 hours Max.Marks :75

Note: 1. This question paper contains two parts A and B.
2. Part A is compulsory which carries 25 marks. Answer all Questions in part A.
3. Part B consists of 5 units. Answer any one full question from each unit. Each question carries 10 Marks and may have a, b, c as sub questions.

PART-A **25 Marks**

1. a) What are the advantages and disadvantages of a linked lists. **(2 M)**

b) Write an algorithm to implement Stack using arrays. **(2 M)**

c) What is the purpose of Deque? **(2 M)**

d) Find the Worst case complexity of Merge sort. **(2 M)**

e) List the applications of trees. **(2 M)**

2. a) Write the Double linked list insertion algorithm. **(3 M)**

b) Write a program to implement Stack using linked list. **(3 M)**

c) Explain Circular queue using arrays insertion algorithm. **(3 M)**

d) Write an algorithm for POST order traversal of a binary tree **(3 M)**

e) What is the use of serarching and sorting? Justify your answer **(3 M)**

PART – B **(50 Marks)**

1) Write a program to implement single linked list. **(10 M)**

(OR)

2 .Write a program in C to implement doubly linked List. **(10 M)**

3) Define prefix, infix and postfix expressions. Convert the given infix expression to postfix using stack
(A+B)-C*(D+E)/G+H **(10 M)**

(OR)

4 a) Explain about how stack is used implicitly in recursion. **(5 M)**

b) Write a program to implement queue using arrays. **(5 M)**

5) Perform the following operations on a Circular queue of size 5 implemented using arrays and write front, rear values, also display the contents of the queue. **(10 M)**

i) Insert 10,15,20,30

ii) Delete two elements

iii) Insert 50,40,30, 25

iv) Delete six elements

(OR)

6)Write a program in C to implement queue using linked list. **(10 M)**

7 a) Write non recursive algorithm for Binary search and also find the time complexity. **(5 M)**

b) To sort the following elements using shell sort **(5 M)**

11,22,44,88,10,12,77,90,55,45,34,98,32,51,86,15 and write the time complexity.

(OR)

8. Write a program in C to implement mergesort.Give example **(10 M)**

9 a) Give the properties of Binary Trees **(5 M)**

b) Write about Expression trees. **(5 M)**

(OR)

10) Write recursive algorithms for Binary tree traversals. **(10 M)**