Vavuniya Campus of the University of Jaffna

First Examination in Information and Communication Technology - 2014

Second Semester - February/March 2016

ICT1242 Practical for Data Structures

Answer All Questions

Time Allowed : **Three** hours

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1. (a) Write a Java program to implement the *doubly linked list* data structure with the following operations, where each node of the doubly linked list has an element of *character type*:

   i. **isEmpty()** - Returns true if the doubly linked list is empty, and returns false otherwise.

   ii. **insertFirst(X)** - Adds element X as the *first node*.

   iii. **insertLast(X)** - Adds element X as the *last node*.

   iv. **deleteFirst()** - Removes the *first node*.

   v. **deleteLast()** - Removes the *last node*.

   vi. **displayForward()** - Displays doubly linked list elements from *first node* to *last node*.

[This question is continued on the next page]

vii. **displayBackward()** - Displays doubly linked list elements from *last node* to *first node.*

viii. **palindrome()** - Returns true if the linked list is a palindrome, and retu false otherwise.

(b) Write an application class for each of the following tasks using the doubly lin list created in part (1a):

i. To read a string **s** from the user and create a *doubly linked list* **d** with ch acters of string **s**.

ii. To display elements of **d** from *first node* to *last node.*

iii. To check whether the given string **s** is a palindrome or not.

2. Write a Java program to arrange the following list of marks in an ascending order using *insertion sort* technique.

56, 85, 72, 75, 70, 48, 92, 66, 71, 62