THE OPEN UNIVERSITY OF SRI LANKA
B.SC. DEGREE PROGRAMME: LEVEL 04
OPEN BOOK TEST: 2010/2011
CSU2279: DATA STRUCTURES AND ALGORITHMS

DURATION: **ONE AND HALF HOURS** (1 ½ HOURS)

Date: **11th March, 2011** Time: **4.00 pm – 5.30 pm**

Answer ALL Questions.

Q1.

a) What is an *ADT*?

b) Describe two properties of an ADT.

c) Write a Pascal programme to create an ADT to store the scores of players of a cricket match. Your program should output all players' names with their scores. Assume that, all players (11 x 2) bat in this match.

d) What is a *data structure*?

e) Name two *grouping mechanisms* in Pascal. Give an example for each mechanism.

Q2.

a) Define the array implementation of a *list* which can hold a maximum of 100 numbers.

b) Define a pointer based *doubly link list* data structure for a class of 25 students to store their names and average of marks.

c) Using an appropriate diagram, explain the need of *header* and *nil* pointer.

d) State the advantages and disadvantages of a *doubly link list*.

e) Compare and contrast the array implementation and pointer implementation of a *list*.

Q3.

a) Compare and contrast the array implementation of a *stack* and a *queue*.

b) Define an array implementation of a *stack* which can hold a maximum of 20 characters.

c) Write a Pascal procedure/function to add 10 character elements in to the above *stack*.

d) Write a Pascal procedure/function to print the contents of the above *stack*.

e) Using appropriate diagrams explain the circular array implementation of a *queue*.