



COMSATS - Lancaster Dual Degree Programme
COMSATS Institute of Information Technology Lahore



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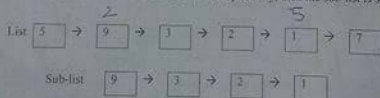
☐ Sessional 1 ☐ Sessional 2 ☒ **Terminal Examination**

SPRING 2016

Course Title:	Data Structure and Algorithms			Course	CSC114	Credit
Instructor/s:	Dr. Ghulam Rasool, Dr. M. AksamIftikhar, Dr. Ghulam Mahdi, M. Adnan			Programme Name:	BS Computer Science	
Semester:	3 rd	Batch:	FA15-BCS, BSE	Section:	BCS(A,B&C), BSE(A, A-R, B)	Date: 31-5-16
Time Allowed:	03 Hour			Maximum Marks:	100	
Student's Name:	Salman Qamar			Reg. No.	SPI5-BSE-071-A	

Question 1.

- Differentiate between linear and non-linear data structures with examples. [Marks: 3+4+8+5=20] [14] [3] [3]
- What is the difference between singly and doubly linked lists? What are the pros and cons of each type of linked list (in terms of memory, computation, and complexity of implementation)? [4] [3]
- Write down pseudo codes for the following operations on a doubly linked list. Clearly mark the input and output of each operation. Also handle the cases of insertion and deletion when the list is empty. [2+4+2]
 - Insertion at the beginning of the list
 - Insertion at the end of the list
 - Deletion from beginning of the list
- Slicing a list is like a substring of a string, i.e., a sub-list is extracted from the list based on a start and end position. Provide a pseudo code for the SLICE method, which takes two inputs, i.e., start and end and outputs a copy of the list starting from the start position and going up to the end position. For example, for the following list, if start and end are 2 and 5, respectively, then the sub-list is shown at the bottom: [5]



Question 2.

[Marks: 4+4+3+3+6=20]

- Convert the following infix expressions to postfix. [4]
 - $(3+1) * ((1+2) * (5+4))$ [4]
- What is the value of following postfix expressions? Show the stack contents as each operand and operator is processed. Make it clear where the top of the stack is at each step? [4]
 - $5\ 1\ 3\ * \ 3\ 1\ - \ *$ [4]