Daffodil International University

Department of Computer Science and Engineering

Faculty of Science and Information Technology

Midterm Examination **Semester: Fall 2017**

Course Code: CSE134 **Course Title: Data Structures**

Section: ALL **Course Teacher: ALL**

Time: 1 hr 30 minutes **Full Marks: 25**

Part A: Analytical (write the answer with reason in the answer booklet) **3 X 2 = 6**

1. Linked list data structure offers considerable saving in
a) Computational Time b) Space Utilization c) Space Utilization and Computational Time
d) None of the mentioned

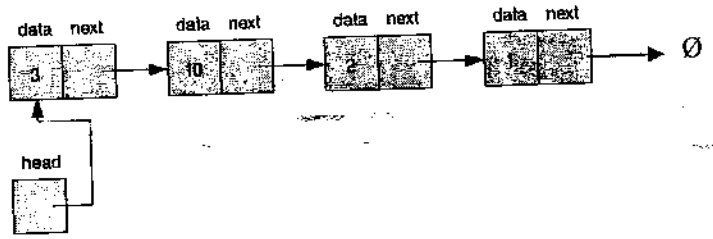
2. Assuming int is of 4bytes, what is the size of int arr[15]; ?
a) 15 b) 19 c) 11 d) 60

3. What kind of linked list is best to answer question like "What is the item at position n?"
a) Singly linked list b) Doubly linked list c) Circular linked list d) Array implementation of linked list

4+3+1+3

Part B: Link List

1. Consider the following link list:



Answer the following questions:
(a) Define the data node and create the link list using C program code.
(b) Write a C function to insert a node between any two node. For example the function "insertBetween" will be called with "10" and "15" where "15" will be inserted after the data node "10".
(c) What will be time complexity if you need to insert a node at the end.
(d) Write a function "count()" which will return number of items in the list.

2+2+2+2

Part C: Queue, Stack and Applications

2. (a) Consider a Stack using link list is created with the following operations:
push(5); push(3); pop(); push(7); push(11); pop(); pop();
draw the state of the stack during each operation and the final content of the stack.
(b) In the linked list implementation of the stack, where does the push member function place the new entry on the linked list and why?
(c) Convert the infix expression 5+3*2-8/4+6-4*2 into postfix using stack.
(d) Given a 5 element stack S (from top to bottom: 2, 4, 6, 8, 10), and an empty queue Q, remove the elements one-by-one from S and insert them into Q, then remove them one-by-one from Q and re-insert them into S. Draw the final stack S.

---------- Good Luck ----------

532*+84/- 6+42*-