PMAS Arid Agriculture University

University Institute of Information Technology

Data Structure & Algorithm (CS-443)

Mid Exam (Spring- 2019) **Max Marks: 18** **Time Allowed: 1.30 Hr.**

Note: Attempt All Questions. Each question carries 6 marks, 3 marks per part.

Question No. 1 (i). Compute the complexity of the following code.

```
int a=5;
int b=0;
while(a<=n+5)
        while(b<=n)

                cout<<"Heloooo";
                cout<<"You are my best friend";
                b=b+1;


        a=a+1;
```

(ii) Assume that there is an Array with **n** number of elements. Write an algorithm based on linear search to search the number 26. If found, replace it with 0.

Question No. 2. (i) In a linked list, assume that 'k' is a reference to a "qNode", where "qNode" is not the last node. Write an algorithm to remove the node after 'k'?

(ii) An IT student implemented a linked list to keep record of his savings during the last 10 months. He decided to have 10 nodes each recording a month's saving. In his search algorithm, he accidently lost the reference to the first/head node but luckily a reference to the fourth node was retained. How many values can he retrieve from the list now, if it is implemented as?

(ii) Singly Linked

(iii) Circular Linked

Can he identify back his original head in any of the above cases?

OR

Question No. 2. Consider the following queue of patients. For each patient the hospital system records his/her Name and Turn Number.

PatientName	TurnNumber
Sara	34
Mehak	35
Zahid	36
Danial	37

i. Write a function to enqueue patients in a queue.
ii. Write a function to dequeue and display each element of queue.

Question No. 3. (a) There is a parking area in a department, you are required to park Cars, Motor Cycles and Bicycles in their respective parking area. What data structure most suitable for this. Write code or algorithm to park each vehicle. (HINT: all spaces are null at beginning, search for empty space to park).

(b) Convert the expression **9+(4-7*(3/2*8)+5)-6** into postfix notation using stack.

************Best of Luck************