International Islamic University Chittagong

Department of EEE
Final Examination
Course Code:CSE-1203
Full Marks:50

Program: B.Sc.Engg. (EEE)
Semester: Spring-2018
Course Title: Data Structure and Algorithm
Time: 02 hours 30 minutes

Figures in the right margin indicate full marks. Use separate script for each part.

PART-A

[Answer any <u>two</u> questions from the followings]

1(a).	How queues are different from stacks? Design an algorithm to insert an element 'ITEM' into a Queue.	04
1(b).	Describe the cases of OVERFLOW and UNDERFLOW for operations in a Queue.	03
1(c).	Explain Deque with a proper figure.	03
2(a).	Write down the parameters those are necessary to manipulate a queue. Write the advantage and disadvantages of link list over linear arrays.	04
2(b).	Write an algorithm to insert a node into a single linked list.	03
2(c).	Write down some situation where Link list is most feasible than any other data structure.	03
3(a).	How a linked list is presented in memory. Explain.	04
3(b).	What is a two way linked list? Write the advantage of two way linked list over ordinary linked list.	03
3(c).	What is a Priority Queue? Describe how the insertion operation works in a priority queue.	03

PART-B

[Answer any <u>three</u> questions from the followings]

4(a).	Define Big O notation with an example.	03
4(b).	Write an algorithm to sort an array A of n elements using selection sort.	03
4(c).	**A: 9, 31, 5, 15, 8, 19 ,4** Apply insertion sort algorithm to sort the array A. Show step by step.	04
5(a).	Draw a Binary Tree for the following algebraic expression and write in-order, pre-order and post-ordertraversal of this tree. (a*g+ b*f) / ((c - d) * e)	05
5(b).	Explain the representation of Binary Trees in memory.	03
5(c).	Describe how Binary Search Tree Works? Give an example.	02
6(a).	Build up the Huffman's tree for the following: Data item: **A, B, C, D, E, F, G, H** Weight:**12, 4, 10, 19, 2, 11, 24, 5**	04
6(b).	Which sorting algorithm is better when insertion sort and selection sort is concerned? Argue with reasons.	03
6(c).	What is General tree? "Binary tree is a special of general tree". Justify.	03
7(a).	Calculate the complexity of insertion sort algorithm. And find the order of this algorithm.	04
7(b).	Compare between selection and bubble sort in three points.	03
7(c).	Discriminate the worst case, the best case and the average case complexities of an algorithm.	03