Daffodil International University

Department of Computer Science and Engineering
Faculty of Science & Information Technology
Midterm Examination, Semester: Summer 2020

Course Code: CSE213 Course Title: Algorithm
Section: PC-A (Eve) Course Teacher: FRS

Time: 04 hours Full Marks: 25

1. What will be the Big O complexity of the following two code snippets? Also describe in your own words. 2x2 = 4

a)

```
char name[100] = "**your name**";

int len = strlen(name);

for(i = 5; i < len; i++)
{
    printf("Hello World\n");
}
```

// Replace **your name** with your Full Name

b)

```
for(i = 0; i < 10; i++)
{
        for(j = 0; j < 1; j--)
        {
          printf("Hello World\n");
          break;
        }
}
```

2. Does merge sort follow the divide and conquer approach? Why or why not? Explain. 2+4 = 6

Simulate insertion sort algorithm to sort the given elements in descending order. Show every single Step.

5 9 1 8

3. Search item 32 using binary search algorithm from the following list. Show every single step. 4

[333, 145, 150, 98, 86, 72, 63, 45, 32]

4. Find the greatest common divisor of (100, 33) using Euclidean Algorithm. 2
Show every single step

5. Simulate Merge Sort algorithm to sort the given elements in ascending order. 4
Show every step.

[333, 122, 145, 98, 86, 72, 63, 45, 42, 50]

6. Suppose you have a file containing the following characters with the corresponding frequency. 1+4 = 5

A	B	C	D
45	13	12	16

If you encode the file with the below code words, what will be the size of your file?

A	B	C	D
000	001	010	011

Is it possible to encode the file with fewer numbers of bits? How will you do it? Show the process step by step.