EXAMINATION PAPER: ACADEMIC SESSION 2019/2020

Campus	Maritime Greenwich
Faculty	Faculty of Liberal Arts and Sciences
School	School of Computing and Mathematical Sciences
TITLE OF PAPER	Algorithms and Data Structures – MOCK EXAM
COURSE CODE	COMP1819
Date and Time	May 2020 - 30 minutes

Answer **ALL** questions

This is a multi-choice, open-book examination. You may access the internet but you may not communicate in any way with another person (including by electronic means).

To give your answers, you must:

- **Submit your answers on Moodle.**
- Also, make sure to mark your choices on the answer sheet (on the last page). If there is a problem with Moodle submission, please send this answer sheet to FLAS-exams@greenwich.ac.uk by the deadline.

Failure to follow any of these instructions may result in you failing the exam.

Answer all questions with the best answer(s):

1. What is the Big-O performance of the following code? (choose 2)

```
for i in range(n):
   for j in range(n):
      k = 2 + 2
```

A. O(k)
B. O(n)
C. O(2*n)
D. O(n*n)
E. O(n^2)

[5 marks]

2. What is the Big-O performance of the following code? (choose 1)

```
i = n
while i > 0:
   k = 2 + 2
   i = i // 2
```

A. O(log i)
B. O(log n)
C. O(k)
D. O(i)
E. O(n)

[5 marks]

3. What is the Big-O performance of the following code (choose 2)?

```
for i in range(n):
   k = 2 + 2
for j in range(n):
   k = 2 + 2
for k in range(n):
   k = 2 + 2
```

A. O(n)
B. O(k)
C. O(n*n)
D. O(n*3)
E. O(4)

[5 marks]

4. Stack is also defined as (choose 1)?
   A. Last in first out
   B. First in last out
   C. Last in last out
   D. First in first out

E. None of the above

[5 marks]

5. Queue is also defined as (choose 1)?
   A. Last in first out
   B. First in last out
   C. Last in last out
   D. First in first out
   E. None of the above

6. The average number of key comparisons required for a successful search for linear search on n items is …. ? (choose 1)

   A. n/2
   B. n
   C. n*2
   D. n^2
   E. None of the above

[5 marks]

7. The average number of key comparisons required for a successful search for binary search on n items is …. ? (choose 1)

   A. n/2
   B. log n
   C. n
   D. n^2
   E. None of the above

[5 marks]

8. What can the best time complexity of bubble sort? (Choose 1)

   A. A constant
   B. n log n
   C. n
   D. n^2 log n
   E. It cannot be defined.

[5 marks]

9. Consider the following code for Selection Sort, what is the Big O performance? (Choose 1)

```
n = len(A)
# Traverse through all array elements
for i in range(len(A)):

    # Find the minimum element in remaining
    # unsorted array
    min_idx = i
    for j in range(i+1, len(A)):
        if A[min_idx] > A[j]:
            min_idx = j

    # Swap the found minimum element with
```

```
13.     # the first element
14.     A[i], A[min_idx] = A[min_idx], A[i]
```

A. O(i)
B. O(n)
C. O(n^2)
D. O(n log n)
E. O(A)

[5 marks]

Answer Sheet

TITLE OF PAPER Algorithms and Data Structures COURSE CODE COMP1819

Your Student ID (e.g 000123456): 00_____

Please circle all correct answers

1. A B C D E
2. A B C D E
3. A B C D E
4. A B C D E
5. A B C D E
6. A B C D E
7. A B C D E
8. A B C D E
9. A B C D E