



ELIZADE UNIVERSITY ILARA-MOKIN

FACULTY: BASIC AND APPLIED SCIENCES
DEPARTMENT: MATHEMATICS AND COMPUTER SCIENCE
2nd SEMESTER EXAMINATION
2017 / 2018 ACADEMIC SESSION

COURSE CODE: CSC 204

COURSE TITLE: Algorithms and Data Structures

COURSE LEADER: Dr. E. F. Ayetiran

DURATION: 2 Hours

HOD's SIGNATURE

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INSTRUCTION:

Candidates should answer any **FOUR** Questions.

Students are warned that possession of any unauthorized materials in an examination is a serious assessment offence.

1. (a) What is queue? How is it different from a deque? Discuss?
(b) What are abstract data types?
(c) Explain with specific examples, three abstract data types each for the following:
(i) Queue (ii) Stack (iii) linked list (iv) Deque (v) List

2. (a) Briefly explain two kinds of algorithm efficiency.
(b) Consider the code snippet below and answer the following questions:
sum = 0;
 for (int i=1; i<=n; i++)
 for (int j=1; j<=n; j++)
 sum++;
(i) Briefly explain the basic algorithm the code is implementing.
(ii) Which line is executing the basic operation in the code?
(iii) What is the growth rate of the input? Explain.
(iv) Explain how efficient the algorithm is by explaining in terms of its growth rate when compared to other possible growth rates.

3. (a) Explain four problems associated with using program implementation to measure the efficiency of algorithms.
- (b) Write an algorithm to represent the problem of searching a list containing n integers to find the one with a particular value k , assuming that k appears exactly once in the list. The sequential algorithm begins at the first index in the list and looks at each index until k is found. It then terminates as soon as k is found.
- (c) Explain the best-case, worst-case and average-case input of an algorithm using 3(b) as a case study.

4. (a) What is data structure?
- (b) What are the factors to consider when selecting a data structure for problem solving?
- (c) Give a formal definition of the following asymptotic notations:
- O -notation
 - Θ -notation
 - Ω -notation

5. (a) Explain also with illustration, the basic processes of computational problem solving.
- (b) Differentiate between a data structure and a file structure.
- (c) Write an algorithm for bubble sort

6. (a) State and explain two ways of specifying an algorithm.
- (b) Write an algorithm for insertion sort
- (c) Consider the list below:

142	8	205	315	447
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- Illustrate, with explanations the operation of insertion sort on the array
- Illustrate, with explanations the operation of bubble sort on the array