CHUKA UNIVERSITY

UNIVERSITY EXAMINATIONS

EXAMINATION FOR THE AWARD OF DEGREE OF BACHELOR OF SCIENCE INCOMPUTER SCIENCE

COMP 410: SOFTWARE ENGINEERING II

STREAMS: Y4S1 **TIME: 2 HOURS**

DAY/DATE: WEDNESDAY 13/12/2017 **2.30 P.M – 4.30 P.M**

INSTRUCTIONS:

- **Answer questions one and any other two questions.**

Question One (30 marks)

(a) Explain what a safety-critical system is. [2 marks]

(b) Discuss three handover problems associated with maintenance of software. [3 marks]

(c) Discuss the differences between refactoring and system re-engineering. [3 marks]

(d) Explain why software maintenance costs are projected to increase over time. [3 marks]

(e) Explain why legacy systems may be critical to the operation of a business. [3 marks]

(f) Discuss the two types of interaction models for components in a distributed system. [4 marks]

(g) Explain the three types of software maintenance tasks. Give a reason why it is difficult to perform any one of them in isolation. [6 marks]

(h) Discuss three differences between thin-client architecture and fat-client architecture models of client server models. [6 marks]

Question Two (20 marks)

(a) Explain how the following software quality attributes may contribute to software dependability. [8 marks]
   (i) Reliability
   (ii) Security
   (iii) Safety
   (iv) Maintainability

(b) Discuss three factors that affect the costs of reverse engineering. [6 marks]

(c) Discuss six advantages accrued from the use of CASE tools in software development activities. [6 marks]

Question Three [20 marks]

(a) Discuss the process of change implementation. [8 marks]

(b) Change is inevitable for any real-world software system. Explain three reasons why a software system must change with time or become progressively less useful. [6 marks]

(c) Suppose your company has embarked on developing distributed applications for the business enterprise. Explain three key design issues that must be considered in development of a distributed software engineering. [6 marks]

Question Four [20 marks]

(a) Discuss four types of attacks that a distributed system should guard against. Suggest measures for dealing with each attack. [8 marks]

(b) Suppose in your software company, you are involved in developing both centralized and distributed software systems. Both of these systems have one property in common "they must be dependable". Discuss six attributes that will prove that your systems are dependable. [12 marks]

Question Five [20 marks]

(a) Describe the importance of developing distributed application software in layers. [4 marks]

(b) Imagine you are implementing a software-based control system. Discuss three circumstances in which it would be appropriate to use a fault-tolerant architecture. [6 marks]

(c) In secure systems programming, discuss five good practice guidelines for developing secure and safe systems. [10 marks]
