(Knowledge for Development)

KIBABII UNIVERSITY

UNIVERSITY EXAMINATIONS
2017/2018 ACADEMIC YEAR

END OF SEMESTER EXAMINATIONS
YEAR FOUR SEMESTER TWO EXAMINATIONS

FOR THE DEGREE OF
BACHELOR OF SCIENCE COMPUTER SCIENCE

COURSE CODE : **CSC 450E**

COURSE TITLE : **COMPUTER SYSTEMS ENGINEERING**

DATE: 19/12/2017   **TIME:** 11.30AM – 1.30PM

INSTRUCTIONS TO CANDIDATES

ANSWER QUESTIONS ONE AND ANY OTHER TWO.

SECTION A

Question One

a) State any two examples of engineered complex systems [2 marks]

b) Explain three factors that have influenced systems engineering [3 marks]

c) Using relevant example, describe the concept of a System of Systems (SoS) [3 marks]

d) Explain the purpose of the following processes in system development;

   i) Stakeholder Requirements Definition Process [2 marks]

   ii) Requirements Analysis Process [2 marks]

e) Discuss the need for an architecture in any given system [4 marks]

f) List any three architectural design considerations in systems or product development [3 marks]

g) Explain the four severity categories of failure modes and effects [4 marks]

h) Explain the role of simulation in the following stages of system development; [3 marks]

   i) Requirements Analysis

   ii) Architectural Design

   iii) Verification

i) Write short notes on;

   i) White box testing [2 marks]

   ii) Black box testing [2 marks]

SECTION B

Question Two

a) Define the term System of Systems (SoS) [2 marks]

b) Explain any four challenges that influence development of system of systems [6 marks]

c) Discus the three aspects of a System or Product life cycle [6 marks]

d) Differentiate the following models;

   i) Rapid prototyping [3 marks]

   ii) Traditional prototyping [3 marks]

Question Three

a) Explain the three primary objectives of decision gates in system life cycle [6 marks]

b) Write short notes on the three types of maintenance [6 marks]

c) Briefly describe any two processes/activities in each of the following testing techniques;

i) Black box basic testing [4 marks]

ii) Black box special testing [4 marks]

Question Four

a) Write short notes on System life cycle stages [6 marks]

b) Briefly describe the following System development models

   i) Waterfall model [3 marks]

   ii) V model [3 marks]

   iii) Agile model [3 marks]

c) Explain any five causes of failure in a given system [5 marks]

Question Five

a) Outline the architectural system design process activities [6 marks]

b) You have been tasked to design a computerized medical system for blood pressure monitoring, as the systems engineer;

   i) List any three stakeholders in the system development [3 marks]

   ii) Outline your responsibilities as a computer systems engineer [4 marks]

   iii) Using a well labeled diagram, illustrate a simple architectural design of the system [4 marks]

   iv) Explain how your design satisfies each of the stakeholders requirements as listed in 4(b)(i) above.

[3 marks]