



(Knowledge for Development)

KIBABII UNIVERSITY

**UNIVERSITY EXAMINATIONS
2017/2018 ACADEMIC YEAR**

**SPECIAL/SUPPLEMENTARY EXAMINATIONS
YEAR FOUR SEMESTER ONE EXAMINATIONS**

**FOR THE DEGREE OF
BACHELOR OF SCIENCE COMPUTER SCIENCE**

COURSE CODE : CSC 450E
**COURSE TITLE : COMPUTER SYSTEMS
ENGINEERING**

DATE: 19/10/2018 TIME: 3:00 P.M – 5:00 P.M

INSTRUCTIONS TO CANDIDATES

ANSWER QUESTIONS ONE AND ANY OTHER TWO.

Constants;

Question One

- a) Define System Engineering [2 marks]
- b) Explain how the following have influenced evolution of systems engineering [1 mark]
- i) Technology [1 mark]
 - ii) Competition [1 mark]
 - iii) Specialization [1 mark]
- c) Using relevant example, Explain why human factors have to be put into consideration during system development [3 marks]
- d) Explain the following terms in relation to system repair and maintenance; [2 marks]
- i) Mean-Time-Between-Failure (MTBF) [2 marks]
 - ii) Mean-Time-To-Failure (MTTF) [4 marks]
- e) Explain any four functions of an architecture in system development [3 marks]
- f) Discuss the importance of simulation and modeling in system design [4 marks]
- g) Explain the four severity categories of failure modes and effects [3 marks]
- h) Explain the role of simulation in the following stages of system development; [4 marks]
- i) Requirements Analysis
 - ii) Architectural Design
 - iii) Verification
- i) Discuss four advantages of preventive maintenance [4 marks]

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) Discuss the Phases of a System Development life cycle [6 marks]
- d) Describe the following models; [2 marks]
- i) Physical models [2 marks]
 - ii) Graphical models [2 marks]
 - iii) Mathematical (deterministic) models [2 marks]

Question Three

- a) Describe the following types of architecture
 - i) Centralized Architecture [2 marks]
 - ii) Distributed Architecture [2 marks]
 - iii) Ring Architecture [2 marks]
- b) Discuss any three factors affecting reliability of equipment. [6 marks]
- c) Briefly describe any two processes/activities in each of the following white box testing techniques;
 - i) Component and Code Coverage Testing [4 marks]
 - ii) Interface Testing [4 marks]

Question Four

- a) Explain the first three steps in the logical fault diagnostic process [6 marks]
- b) Briefly describe the following System development models
 - i) Iterative model [3 marks]
 - ii) Spiral model [3 marks]
 - iii) Prototype model [3 marks]
- c) Briefly describe four fault finding techniques [6 marks]

Question Five

- a) Compare Hardware and software architecture optimization [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]