(Knowledge for Development)

KIBABII UNIVERSITY

(KIBU)

UNIVERSITY EXAMINATIONS
2020/2021 ACADEMIC YEAR
END OF SEMESTER EXAMINATIONS
YEAR ONE SEMESTER TWO EXAMINATIONS

FOR THE DEGREE OF
MASTERS OF INFORMATION TECHNOLOGY

COURSE CODE: MIT820

COURSE TITLE: ARCHITECTURES FOR SOFTWARE SYSTEMS AND EMERGING ISSUES

DATE: 27/11/2021   **TIME: 9.00 AM – 12.00 PM**

INSTRUCTIONS TO CANDIDATES

ANSWER **ANY THREE QUESTIONS**

QUESTION ONE [20 MARKS]
a. Briefly explain the technical importance of Software Architecture.   [2 Marks]
b. "Architecture is the vehicle for stakeholder communication". Justify.   [2 Marks]
c. Explain the difference between Architectural Style and Architectural Patterns.   [2 Marks]
d. i. Using neat diagrams, describe any two different types of architectural styles.   [6 Marks]

ii. For each of the architectural styles described in (i) above, discuss its benefits and explain the forces that influence the solutions to problems based on it. **[8 Marks]**

QUESTION TWO [20 MARKS]

a. Describe the main phases of the general software development life cycle model. **[8 Marks]**

b. Explain why the Waterfall cycle and V-shaped cycle models are inappropriate for large design projects. **[2 Marks]**

c. "The Spiral model overcomes the limitation of the Waterfall cycle model and the V-shaped cycle model". Justify. **[2 Marks]**

d. Explain software reliability and discuss how software and hardware reliability related to each other. **[4 Marks]**

e. Discuss the benefits of a good security architecture. **[4 Marks]**

QUESTION THREE [20 MARKS]

a. You have been appointed as a project manager for a software project at Kibabii University that has been funded by the Danish Government. You realize that managing software quality is a vital element of every stage of project management. To attract more funds and to deliver excellent software quality you must work smart. Discuss any five ways you are going to use to ensure you deliver excellent quality software. **[10 Marks]**

b. Discuss any five software quality attributes with respect to improving system quality. **[10 Marks]**

QUESTION FOUR [20 MARKS]

a. Identify two reasons why software process is difficult to improve. **[2 Marks]**

b. We are yet to meet a business leader who believes that every process in the organization is perfect. All business leaders want to get lower costs, better customer satisfaction scores, more efficiency, and new ways of driving revenue. The difference between organizations that achieve these ends, and those that can't, often comes down to the structure upon which process improvement initiatives are built. Software process improvement offers a number of compelling advantages. Using relevant scenarios, discuss any five reasons why an organization would consider SPI. **[10 Marks]**

c. SPI mainly consists of 4 cyclic steps. With the aid of a well labelled diagram, discuss these steps and show how they relate to each other. **[8 Marks]**

QUESTION FIVE [20 MARKS]

a. Compare and contrast TOGAF, SABSA and OSA security architecture frameworks. **[6 Marks]**

b. Survivability achieves its objectives of delivering essential services and preserving essential assets via three primary capabilities known as the three R's of survivability. Discuss how survivability can be achieved through these capabilities. **[6 Marks]**

c. Identify any four security threats to an organization and explain the strategies that can be used to minimize each of the threats. **[8 Marks]**