AFRICA UNIVERSITY
(A United Methodist-Related Institution)
"Investing in Africa's Future"

COLLEGE OF ENGINEERING AND APPLIED SCIENCES(CEAS)

NCSC 401 SOFTWARE EVOLUTION AND ENGINEERING

END OF SECOND SEMESTER EXAMINATION

APRIL 2025

LECTURER: MR J. CHINZVENDE

TIME: 3 HOURS

INSTRUCTIONS

Answer questions instructed in each section

Start **each** question on a new page.

The marks allocated to **each** question are shown at the end of the section.

Answer all questions in Section A and Chose Two in section B

Credit will be awarded for logical, systematic and neat presentations.

Section A

Answer ***all*** questions from this section

Question One

Define the following terms as they are used in Software Evolution and Re-engineering

a. Encapsulation
b. Version Control
c. Code Refactoring
d. Requirements Evolution
e. Software Re-engineering **[10]**

Question Two

A software product has been in the market for several years, and user requirements have changed significantly since its initial launch.

a. What factors contribute to the need for software evolution in this context?
b. How can the development team effectively gather and prioritize user requirements for future iterations? **[10]**

Question Three

A company is migrating to a new database system but needs to keep the old and new systems in sync during the transition period.

a. What strategies could you implement to ensure data consistency between the two systems during migration?
b. Discuss the potential challenges of data synchronization in this scenario. **[10]**

Question Four

Users reported that the legacy system is slow and unresponsive, impacting productivity.

a. What methods would you use to identify performance bottlenecks in the legacy system?
b. How can you optimize performance without undertaking a complete system overhaul?**10]**

SECTION B

Answer any ***two (2)*** questions from this section

Question Five

A company has a legacy system that has been in use for over 15 years. The system is critical for operations but is becoming increasingly difficult to maintain due to outdated technology.

a. What steps would you recommend to the company for re-engineering this legacy system?
b. Discuss the potential risks involved in the re-engineering process and how they can be mitigated **[25]**

Question Six

A company currently uses a monolithic architecture for their e-commerce platform. As the business grows, they face scalability issues and deployment challenges.

a. What steps would you take to re-architect the application from a monolithic to a microservices architecture?
b. Discuss the advantages and potential challenges of this transition. **[25]**

Question Seven

Africa University's financial system has undergone several changes over the years, resulting in a complex and poorly structured codebase.

a. Suggest specific code refactoring techniques that AU can be apply to address these issues.
b. Explain why regression testing is important during system modifications and describe strategies to ensure effective regression testing. **[25]**

END OF EXAMINATION