INTERNATIONAL UNIVERSITY OF EAST AFRICA

'Learning to Succeed'

FACULTY OF SCIENCE AND TECHNOLOGY

END OF SEMESTER EXAMINATIONS - APRIL 2025

PROGRAMME: BSSE
YEAR/SEM: YEAR 3/SEMESTER 2
COURSE CODE: SWE3200
NAME: SOFTWARE EVOLUTION

DATE:
TIME:

INSTRUCTIONS TO CANDIDATES:

SECTION A

Attempt all Questions (40 marks)

Question 1:

a) Mention any three factors that would be considered during software re-engineering (**6 marks).**
b) Explain any six laws of software evolution (12 marks)
c) Elaborate on the origins of software development projects (6 marks)
d) Differentiate between the two types of prototyping **(4 marks**)
e) Explain any three objectives of software architecture evolution (**6 marks**)
f) Explain the various types of software maintenance that can be performed **(6 marks).**

Question 2:

a) Illustrate and explain the steps involved in prototyping (**14 marks**).
b) Discuss any four principles of extreme programming (**8 marks**).
c) Discuss the five components of software architecture evolution **(10 marks).**
d) Explain any four concepts included in software re-engineering **(8 marks).**

SECTION B

Attempt only 3 Questions. Each Question carries 20 marks

Question 1:

A company has a legacy system for which they would wish to recover its design, and functions by analysing its code.

a) Recommend to them the right technique to use and its importance? **(6 marks)**

b) Elaborate the types of the technique mentioned in (1 a) above **(4 marks).**

c) Explain the steps that would be followed in the implementation of the technique selected in (1 a) above **(10 marks).**

Question 2:

A company has an existing system that they would wish to redesign and redevelop so as to improve its performance, scalability and maintainability.

a) Recommend to them the right technique to use and its importance? **(6 marks)**

b) Elaborate the any principles to adhere to while implementing the technique mentioned in (2 a) above **(4 marks).**

c) Explain the steps that would be followed in the implementation of the technique selected in (2 a) above **(10 marks).**

Question 3:

A software renovation refers to the process of enhancing broken, poor performing, and non-functioning parts of a software system.

a) Elaborate on the various approaches to software renovation. **(8 marks).**

b) Explain the software renovation process (**12 marks).**

Question 4:

Software architecture evolution refers to the process of modifying,

updating, and enhancing the architecture of a software system over time.

a) There been various key milestones in the evolution of software architecture: Explain any five kinds of software architectures that you know (**10 marks**).

b) Explain the various steps involved in the evolution of software architectures (10 marks)

Question 5:

Software maintenance helps to keep a software up-to date and also improve its performance.

a) Explain the any five laws of software maintenance that you know (**10 marks**).

b) Illustrate and explain the process of software maintenance **(10 marks).**

Question 6:

Uganda Airlines is seeking for a software development company to upgrade its aircraft safety software. The developed software must comply with the internationally set standards that are closely monitored by the International Civil Aviation Organization (ICAO). If you are to apply for this software development task:

i. What software development methodology/model would you recommend for this project? Briefly explain your choice of methodology. **[4 marks]**

ii. With help of a diagram, describe the software development process for your preferred methodology in **(a)** above. **[12 marks]**

iii. Briefly explain two disadvantages associated with your preferred software development methodology in **(a)** above. **[4 marks]**

Question 7:

An information System refers to an integrated set of components forcollecting data, processing data, storing and delivering/outputting information.

a) With an illustration, discuss at-least eight types of information systems, mention the organisational levels on which those systems work and the various users who use them (20 marks)

Question 8:

Information systems help an organization to achieve its goals by increasing the performance, productivity and efficiency of the employees.

a) Discuss the three origin of Information Systems Development Projects (**6 marks).**

b) Illustrate and explain the waterfall software development model (**14 marks**).

Question 9:

Updating the architecture of a software system over time is very important to address the emerging challenges.

a) Explain any five techniques used in software architecture evolution (**10 marks**).

b) Discuss any five factors that are considered in the evolution of software architectures (10 marks).

Question 10:

Software re-engineering involves analysing and redefining existing systems to meet new requirements or take advantage of emerging technologies.

a) Elaborate on any other five uses or importances of Software re-engineering **(10 marks).**

b) Explain any five categories of tools that can be used in software re-engineering **(10 marks).**

Question 11:

Enhancing broken, poor performing, and non-functioning parts of a software system is very important in software evolution.

a) Explain any five reasons that would force a company to apply software renovation? **(10 marks)**

b) Discuss any five factors that a company would consider when deciding to do software renovation **(10 marks)**

Question 12:

Reverse engineering involves analysing compiled programs to understand their design and functionality.

a) Elaborate on any other five uses or importances of reverse engineering **(10 marks)**

a) Explain any five principles followed during reverse engineering **(10 marks)**