KIRIRI WOMENS' UNIVERSITY OF SCIENCE AND TECHNOLOGY
UNIVERSITY EXAMINATIONS, 2024/2025 ACADEMIC YEAR
FIRST YEAR, FIRST SEMESTER EXAMINATION
FOR THE DIPLOMA IN SOFTWARE ENGINEERING

DSE 1001 INTRODUCTIONS TO SOFTWARE ENGINEERING

Date: 12TH AUGUST, 2024
Time: 8:30 AM – 10:30 AM

INSTRUCTIONS TO CANDIDATES
ANSWER QUESTION ONE (COMPULSORY) AND ANY OTHER TWO QUESTIONS

QUESTION ONE: COMPULSORY (30 MARKS)

a) Differentiate between the following in relation to the properties of quality software.
  - **i.** Portability and Usability **(2 Marks)**
  - **ii.** Maintainability and Scalability **(2 Marks)**
  - **iii.** Co-existence and Interoperability **(3 Marks)**

b) Software engineers shall commit themselves to the development of software a beneficial and respected profession. In accordance with their commitment to the health, safety and welfare of the public, highlight four principles software engineers are required to adhere to. **(4Marks)**

c) SecureIT Solutions, a mid-sized cybersecurity firm, recently experienced a significant data breach. Sensitive client information was compromised due to a lapse in updating their security protocols. The breach affected several high-profile clients, leading to financial and reputational damage.
  - i. Discuss the professional responsibilities of the cybersecurity team in preventing such breaches. **(5 Marks)**
  - ii. How can adherence to a professional code of ethics help prevent similar incidents in the future by Providing specific examples related to SecureIT Solutions. **(5 Marks)**
  - iii. Analyze the impact of the data breach on various stakeholders, including clients, employees, and shareholders. **(5 Marks)**

d) Software engineers shall commit themselves to the development of software a beneficial and respected profession. In accordance with their commitment to the health, safety and welfare of the public, highlight four principles software engineers are required to adhere to. **(4 Marks)**

QUESTION TWO (20 MARKS)

HealthCare Inc. operates with a legacy software system that manages patient records. The system is outdated, leading to frequent downtimes and security vulnerabilities. The company has decided to upgrade to a more modern, robust system. The transition needs to be smooth to ensure continuity of critical healthcare services.

a) Identify and describe the types of software maintenance that HealthCare Inc. needs to consider during and after the upgrade. **(5 Marks)**

b) Discuss the challenges HealthCare Inc. might face in evolving from the legacy system to the new system. **(5 Marks)**

c) Propose strategies for a seamless transition from the old system to the new system while minimizing disruptions to healthcare services. **(5 Marks)**

d) Explain the importance of stakeholder communication during the software upgrade process by Providing examples relevant to HealthCare Inc. **(5 Marks)**

QUESTION THREE (20 MARKS)

EduLearn, an emerging EdTech startup, is developing an online learning platform aimed at providing interactive and engaging educational content. The platform must be user-friendly, scalable, and secure to cater to a large number of users, including students and educators.

a) Outline the phases of the software development lifecycle (SDLC) and describe how each phase can be applied in the development of the EduLearn platform. **(5 Marks)**

b) Discuss the importance of requirements engineering in the EduLearn project. Identify potential challenges and how they can be addressed. **(5 Marks)**

c) Explain how Agile methodology can be beneficial for the development of EduLearn. Providing examples of Agile practices that can be applied. **(5 Marks)**

d) Describe Five role of quality assurance in the EduLearn project.? **(5 Marks)**

QUESTION FOUR (20 MARKS)

FinTech Innovators, a company specializing in financial technology solutions, is transitioning from a traditional Waterfall approach to Agile methodology to enhance its product development process. The company aims to improve collaboration, increase flexibility, and deliver products more efficiently to meet market demands.

a) Explain the core principles of Agile methodology. **(5 Marks)**

b) Describe the Scrum framework and its components (e.g., roles, ceremonies, artifacts **(5 Marks)**

c) Discuss the benefits and potential drawbacks of adopting Agile methodology for FinTech Innovators. **(5 Marks)**

d) Identify and explain key metrics that FinTech Innovators can use to measure the success of their Agile transformation. **(5 Marks)**

QUESTION FIVE (20 MARKS)

Smart City Innovations, a company working on smart city solutions, is considering a hybrid approach that combines elements of both Agile and Waterfall methodologies to manage their complex projects. The projects involve multiple phases, extensive planning, and require flexibility to adapt to changing requirements.

a) Explain what is meant by a hybrid software development methodology.and discuss how you combining Agile and Waterfall methodologies benefit SmartCity Innovations? **(6 Marks)**

b) Describe how SmartCity Innovations can structure their project phases to incorporate both Waterfall and Agile practices. **(6 Marks**

c) Identify potential risks associated with using a hybrid approach and discuss How can SmartCity Innovations mitigate these risks? **(4 Marks)**

d) Discuss the lessons learned and how SmartCity Innovations can apply these insights to their projects. **(4 Marks)**