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# 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: SOFTWARE REQUIREMENTS AND SPECIFICATIONS DATE: 5<sup>TH</sup> DECEMBER 2024 TIME: 2:30PM-4:30PM

#### <u>INSTRUCTIONS TO CANDIDATES</u> <u>ANSWER QUESTION ONE (COMPULSORY)</u> AND ANY OTHER TWO QUESTIONS

### **QUESTION ONE: COMPULSORY (30 MARKS)**

# **Case Study: Software Requirements for an E-Commerce Website**

A company plans to develop an e-commerce website where customers can browse products, add items to a cart, and make purchases online. The website should also allow customers to create accounts, log in, track their orders, and contact customer service. The company wants the system to handle high traffic and maintain security, especially for payment transactions. Additionally, the system should be scalable to accommodate future growth and include a mobile-friendly interface.

During the requirements engineering process, stakeholders identified both functional and non-functional requirements. Some of the key functional requirements include user registration, login, product browsing, cart management, checkout, payment processing, and order tracking. The non-functional requirements include performance, scalability, security, and usability.

To ensure that the project meets all stakeholder needs, the requirements engineering team will gather, analyse, and validate these requirements before passing them to the design and development teams.

a) Differentiate between the functional and non-functional requirements identified in this case study.

(5 Marks)

- b) Discuss Why is it essential to gather both functional and non-functional requirements during the requirements engineering process? (5 Marks)
- c) In the context of the e-commerce website, how would you validate the security requirements during the requirements engineering phase? (5 Marks)
- d) Discuss **FIVE** roles of stakeholders in the requirements engineering process for this e-commerce website.

(5 Marks)

- e) Consider that the system needs to be scalable for future growth. What are some of the non-functional requirements related to scalability that should be considered during the requirements engineering process?
  (5 Marks)
- f) Describe how a prototype could help in refining the software requirements for the e-commerce website.

### **QUESTION TWO: (20 MARKS)**

- a) Explain three advantages and disadvantages of using interviews, questionnaires, and workshops for requirements elicitation in software projects. (6 Marks)
- b) Describe four role of Joint Application Development (JAD) in the requirements elicitation process. How does it differ from other techniques like prototyping? (8 Marks)
- c) Discuss how document analysis and observation can complement other requirements elicitation techniques in a large-scale software development project. (6 Marks)

### **QUESTION THREE: (20 MARKS)**

- a) Discuss four common sources of conflict in software requirements, and how can they be identified and resolved during the requirements analysis phase? (8 Marks)
- b) Explain three process of prioritizing requirements in a project with limited resources. What criteria should be considered when prioritizing functional and non-functional requirements? (6 Marks)
- c) Describe three concept of requirements traceability. Why is it important, and what tools or techniques can be used to ensure that traceability is maintained throughout the software development life cycle?

#### **QUESTION FOUR: (20 MARKS)**

- a) Explain four ways on how use case diagrams can be used to model system functionality. Provide an example of a use case diagram for an online ticket booking system. (8 Marks)
- b) Describe three purpose of Entity Relationship Diagrams (ERDs) in requirements modelling (6 Marks)
- c) Compare and contrast Data Flow Diagrams (DFDs) and Unified Modelling Language (UML) diagrams.

(6 Marks)

(6 Marks)

#### **QUESTION FIVE: (20 MARKS)**

- a) Outline three structure of a Software Requirements Specification (SRS) document based on IEEE standards. (6 Marks)
- b) Discuss three best practices for writing clear and concise software requirements? (6 Marks)
- c) Discuss four significance of IEEE standards in writing SRS documents. How do these standards ensure consistency and quality in software requirements? (8 Marks)