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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 1003 SOFTWARE REQUIREMENTS AND SPECIFICATIONS

Date: 13TH AUGUST, 2024

Time: 11:30 AM – 1:30 AM

INSTRUCTIONS TO CANDIDATES

ANSWER QUESTION ONE (COMPULSORY) AND ANY OTHER TWO QUESTIONS

QUESTION ONE: COMPULSORY (30 MARKS)

ABC Bank is planning to develop a new Online Banking System to improve customer service and operational efficiency. The system will allow customers to perform banking transactions online, including account management, fund transfers, bill payments, and loan applications. The bank aims to ensure the system is secure, user-friendly, and scalable to accommodate future growth.

- Define software requirements and discuss their importance in the development of the Online Banking System. **(4 Marks)**
- Analyze and list down two functional and two non-functional requirements specific to the Online Banking System based on the scenario provided. **(4 Marks)**
- Develop a Use Case Diagram illustrating key interactions between users (customers, administrators) and the Online Banking System. **(4 Marks)**
- Discuss three techniques for validating requirements for the Online Banking System. **(6 Marks)**
- Outline two benefits of Entity-Relationship Diagrams (ERDs) in defining data relationships for customer accounts and transactions. **(4 Marks)**
- Highlight two common validation issues that could arise during the development of the online Banking System and how to address them effectively. **(4 Marks)**
- Discuss the features and benefits of two popular tools you will use for requirements management to facilitate efficient and effective development of the online Banking System. **(4 Marks)**

QUESTION TWO (20 MARKS)

- Discuss the challenges associated with Requirements Elicitation. **(6 Marks)**
- Explain the structure of the IEEE 830 Standard for Software Requirements Specifications (SRS) and state why clear and concise requirements documentation is crucial for the development of any software engineering project. **(8 Marks)**

- c) Discuss techniques for validating Non-Functional Requirements. Provide examples to illustrate your discussion. **(6 Marks)**

QUESTION THREE (20 MARKS)

ABC Books is a popular online bookstore that sells a wide range of books to customers worldwide. They have decided to upgrade their current manual system to an automated Online Bookstore Management System to streamline operations and enhance customer experience.

- a) Draw a Level 1 DFD for the Online Bookstore Management System. Clearly indicate the main processes, data stores, data flows, and external entities involved. Provide a brief explanation of the components of your DFD. **(6 Marks)**
- b) Design an ERD for the Online Bookstore Management System. Identify the main entities, their attributes, and relationships between entities. Ensure to include cardinality and participation constraints where necessary. Justify your choices and assumptions. **(6 Marks)**
- c) Develop a State Transition Diagram for the "Order" entity within the Online Bookstore Management System. Define the different states an order can transition through from creation to completion. Include appropriate events triggering state transitions and actions associated with each state. Provide a clear explanation of your State Transition Diagram. **(8 Marks)**

QUESTION FOUR (20 MARKS)

ABC Retail, a popular retail chain, wants to expand its operations by launching an online shopping platform. The platform aims to offer a wide range of products from various categories such as electronics, fashion, home appliances, and groceries. Customers should be able to browse products, add them to their cart, make payments securely, and track their orders. Additionally, the platform should support user registration, product reviews, and promotional offers.

- a) Develop a Use Case Diagram for the Online Shopping platform. **(8 Marks)**
- b) Outline the key sections that should be included in the Requirements Document for the Online Shopping platform. Explain why each section is important for stakeholders and development teams **(8 Marks)**
- c) Discuss strategy for validating and managing the requirements identified for the Online Shopping platform. **(4 Marks)**

QUESTION FIVE (20 MARKS)

- a) Describe any four key features that a good Requirements Management tool should have and explain how each feature contributes to effective requirements management. **(8 marks)**
- b) Explain the importance of effective change management processes in Requirements Management **(4 Marks)**
- c) Illustrating your answer with relevant examples or case studies, discuss key strategies for managing changes to requirements throughout the software development lifecycle. **(8 marks)**