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KIRIRI WOMEN'S UNIVERSITY OF SCIENCE AND TECHNOLOGY
UNIVERSITY EXAMINATION, 2024/2025 ACADEMIC YEAR
SECOND YEAR, FIRST SEMESTER EXAMINATION
FOR THE BACHELOR OF SCIENCE IN INFORMATION TECHNOLOGY
KCS 2205 – SYSTEM ANALYSIS AND DESIGN

Date: 11TH December 2024

Time: 11:30AM – 1:30PM

INSTRUCTIONS TO CANDIDATES

ANSWER QUESTION ONE (COMPULSORY) AND ANY OTHER TWO QUESTIONS

QUESTION ONE (30 MARKS)

- a) AlphaTech is a technology company that specializes in developing customized software solutions for various industries. As part of its latest project, AlphaTech is tasked with developing a comprehensive inventory management system for a mid-sized retail client. The project aims to enhance the client's operational efficiency, streamline inventory tracking, and improve reporting capabilities. The development team, consisting of system analysts, developers, a system administrator, and a system designer, is currently in the system investigation phase. The team is focused on gathering detailed requirements and understanding the client's existing inventory processes to design an effective solution.
- i) **Based on the case study above, describe the key elements that a system analyst must capture and document during a system investigation and survey.** (4 Marks)
- ii) **Based on the case study above, differentiate between functional system requirements and non-functional system requirements, providing examples for each category.** (4 Marks)
- iii) **Explain three common methods of system investigation used for data collection in system development based on the case study above.** (6 Marks)
- b) **Distinguish between the following:**
- i) **Open and closed system** (1 Mark)
- ii) **Decision trees and decision tables** (1 Mark)
- c) **Explain 3 advantages observing workers to determine systems requirement.** (3 Marks)
- i) **What is the difference between a system analyst and a system designer?** (2 Marks)
- ii) **Identify four challenges a system analyst is likely to encounter in his or her work.** (4 Marks)
- d) **Michelle works as an analyst in a small software development firm in Kenya. The firm develops software that manages university admissions process. Michelle wants to quickly develop a user interface to demonstrate to a potential client how the final system will appear and function**
- i. **Discuss the most appropriate methodology for this kind of development.** (2 Marks)
- ii. **Outline three principles that can guide Michelle while designing the user interface.** (3 Marks)

QUESTION TWO (20 MARKS)

- a) **Despite how well users are satisfied with the system or efficient the processing is, a system cannot be considered adequate unless it is documented to a very high standard. Briefly describe three reasons why much emphasis is placed on high quality documentation.** (6 Marks)
- b) **A customer places an order. The order food process receives the order, forwards it to the kitchen,**

store in the order data store and store the updated inventory details in the inventory data store. The process also delivers a bill to the customer. Manager can receive reports through the generate report process which takes inventory details and orders as input from the inventory and order data store respectively. Model the entries and processes for the above system and represent that in a data flow diagram. (8 Marks)

- c) The introduction of the computer based information system can create fear and reluctance on the part of the users. Outline six reasons for such user's resistance. For each reason provide an explanation on how to overcome each. (6 Marks)

QUESTION THREE (20 MARKS)

- a) Assuming you are a senior system analyst working in an IT department of a large organisation that currently uses the traditional SDLC as the standard for developing new systems. You have been asked by your manager to examine a number of structured systems methodologies with a view of recommending the most appropriate one to be adopted by the company
- i) Elucidate four features of the structured approach to systems analysis and design. (8 Marks)
 - ii) Briefly describe the main stages in the traditional systems development lifecycle (SDLC) stating the main deliverables/products of each stage. (8 Marks)
- b) Explain the advantages of walkthroughs in systems developments. (4 Marks)

QUESTION FOUR (20 MARKS)

- a) When a new patient is seen for the first time they complete a patient information form that asks their name, address, phone number and insurance carriers all which are stored in the patient information file. Patient can be signed up to be seen by the doctor. Each time a patient visits the doctor, an insurance claim is sent to the carriers for payment. The claim must contain information about the visit, such as the date, purpose and cost. It would be possible for a patient to submit two claims on the same day. Draw an Entity Relationship Diagram (ERD) for this case showing: entities, attributes, relationship, cardinalities and identifiers (primary and foreign key). You must state all assumptions you make in creating the ERD and you need to provide a narrative in plain language describing what your ERD says. (10 Marks)
- b) Mercy graduated from a local university in 2022 with a degree in Business Information Technology (BBIT) but with minimum experience in IT implementation. Her parents have been running a video library in Kitale town and two others in Eldoret. The libraries rent and sell audio CDS, video CDS, DVDS audio tapes and video tapes as well as story books. Mercy would like to automate the manual libraries and intends for the project to take not more than three months. Analyse any three possible changes –over techniques Mercy could use to implement the systems at the three sites and select one you consider most appropriate for this project and justify your choice. (10 Marks)

QUESTION FIVE (20 MARKS)

a) Explain five components of an E-R diagram (5 Marks)

b) During development of Kiriri University Library System, there were many rules documented, that is a procedure for becoming a member of library, rule for issuing books etc. The membership rule stated

“Anyone whose age is 18 or more than that can become a member of library. There are two types of memberships depending upon the duration of membership. First is for 6 months and other is for 1 year 6 months membership fee is ksh 1000 and 1 year membership fee is Ksh 1500”.

i) Draw a decision tree for the membership rule (8 Marks)

ii) Draw a decision table for the membership rule (7 Marks)