

Kasarani Campus Off Thika Road P. O. Box 49274, 00101 NAIROBI Westlands Campus Pamstech House Woodvale Grove Tel. 4442212 Fax: 4444175

KIRIRI WOMEN'S UNIVERSITY OF SCIENCE AND TECHNOLOGY UNIVERSITY EXAMINATION FOR 2024/2025 ACADEMIC YEAR SECOND YEAR, SECOND SEMESTER EXAMINATION FOR THE BACHELOR OF SCIENCE IN COMPUTER SCIENCE

KCS 2205 SYSTEM ANALYSIS AND DESIGN

Date: 9TH AUGUST, 2024 Time: 2:30 PM – 4:30 PM

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

QUESTION ONE: COMPULSORY (30 MARKS)

- a) Define the following terms:
 - i) System analysis and design
 - ii) Requirement
- b) During system design some basic principles should be followed to achieve system success. Explain any FOUR of those design principles. (4 Marks)
- c) Consider the following scenario for a grocery store cashier. The CUSTOMER brings the ITEMS to the register; PRICES for all ITEMS are LOOKED UP, and then totaled; next, PAYMENT is given to the cashier and finally, the CUSTOMER is given a receipt. Sketch a data flow diagram for the scenario.

(6 Marks)

d) Being a System analyst, you have been requested to develop a Hospital Reception subsystem or module that supports some of the many job duties of a hospital receptionist. Receptionist schedules patient's appointment and admission to the hospital, collects information from the patient by phone and/or upon patient's arrival to the hospital. For the patient that will stay in the hospital ("inpatient") she or he should have a bed allotted in a ward. Receptionists might also receive patient's payments, record them in a database and provide receipts, file insurance claims and medical reports.

Draw a use case diagram that can guide programmers when developing the hospital reception system.

(6 Marks)

- e) After a system has fully been developed, there is always the changeover from the old existing system to the new developed system. Discuss any **THREE** changeover strategies that can be applied to achieve the transition.
 (3 Marks)
- f) With the use of appropriate diagrams, describe the following models used in SDLC, giving the strengths and weaknesses of each, as well as a suitable application area of each.

i)	Waterfall or linear model	(3 Marks)
ii)	Spiral model	(3 Marks)
iii)	V- model	(3 Marks)

QUESTION TWO: (20 MARKS)

a) Feasibility study is carried out to determine the viability of a system project. Describe THREE types of feasibility study.
 (6 Marks)

(1 Mark) (1 Mark)

- b) Discuss the system development life cycle, clearly indicating the activities done and the expected outcome in each stage. (8 Marks)
- c) Differentiate between the following types of system testing
 - i) White box and black box testing (2 Marks) ii) Unit and system testing (2 Marks) (2 Marks)
 - iii) Alpha and beta testing

QUESTION THREE: (20 MARKS)

- a) Giving examples, discuss any **SEVEN** characteristics of a well-designed user interface. (7 Marks)
- b) Use the following case study to answer the questions below.

A General Hospital consists of a number of specialized wards (such as Radiology, Oncology, etc). Information about ward includes unique name, total numbers of current patients. Each ward hosts a number of patients, who were admitted by a consultant (doctors) employed by the Hospital. On admission, the date and time are kept. The personal details of every patient include name, Medical Recode Number (MRN), set of phones and one address (city, street, code). A separate register is to be held to store the information of the tests undertaken. Each test has a unique episode No., category and the final result of test.

i)	Explain FIVE activities that are involved in database design	(5 Marks)
ii)	Identify the entities involved.	(2 Marks)
iii)	Outline the attributes associated with each entity named in (ii) above.	(2 Marks)
iv)	Sketch an Entity Relationship Diagram for the hospital database	(4 Marks)

QUESTION FOUR: (20 MARKS)

a) In system implementation, changes may be requested and therefore proper measures need to be in place to manage and control them. Highlight the process of a software change request. (6 Marks)

- b) The user interface design will include identifying the type of interface to be used to interact with the system. Describe the **THREE** applicable user interfaces? (6 Marks)
- c) Explain the difference between verification and validation. Give an example of a technique which can be used for each. (4 Marks)
- d) Briefly describe the following software development methodologies:
 - i) Structured methods (2 Marks) ii) Object oriented model (2 Marks)

QUESTION FIVE: (20 MARKS)

- a) i) Using examples differentiate between functional and non-functional requirements. (4 Marks)
 - ii) User requirements are normally written using natural language statements that are easy to understand by their corresponding customers. Discuss **THREE** challenges of this natural language in expressing requirements. (6 Marks)
- b) The system analyst is one of the personnel that determines the success or failure of a system project. Describe FIVE qualities that he is supposed to have in order to fully accomplish his/her duties satisfactorily. (5 Marks)
- c) Highlight **FIVE** reasons why you think that a system analyst needs to study system analysis and design. (5 Marks)