INTERNATIONAL UNIVERSITY OF EAST AFRICA
'Learning to Succeed'

FACULTY OF SCIENCE AND TECHNOLOGY

END OF SEMESTER EXAMINATIONS - DECEMBER 2025

PROGRAMME: MIT
YEAR/SEM: YEAR 1/SEMESTER 1
COURSE CODE: MIT712
NAME: SYSTEM ANALYSIS AND DESIGN-M

DATE:
TIME:

INSTRUCTIONS TO CANDIDATES:

SECTION A

Section A Compulsory question (20 marks)

Question 1:

A private hospital plans to introduce an Electronic Medical Records (EMR) System to replace manual patient files. The system will handle registration, consultations, laboratory results, prescriptions, billing, and follow-up management.

a) Describe the major stakeholders in this system and their roles.

(6 marks)

b) Draw a Context Diagram for the EMR system.

(8 marks)

c) Explain three challenges the hospital may face during system implementation.

(6 marks)

Question 2:

A university wants to develop an Integrated Student Services System to manage student registration, course enrolment, fee payments, hostels, and exam results. Currently, the departments operate independently, causing delays, missing records, and poor coordination.

a) Identify and discuss five key problems the new system must solve.

(5 marks)

b) Describe five functional requirements and five non-functional requirements suitable for this system.

(10 marks)

c) Explain how the system analyst would use requirements-gathering techniques in this project.

(5 marks)

SECTION B

Answer any Four Questions in Section B. Each question is 20 marks

Question 1:

A mobile money company wants to develop an app that supports: customer registration, sending money, withdrawing money, buying airtime, paying bills, and viewing transaction history.

a) Discuss the importance of Use Case Diagrams in requirements gathering. (10 marks)

b) Draw a Use Case Diagram for the mobile money system described above. (10 marks)

Question 2:

A retail store is implementing an online ordering workflow.

a) Describe the key components of an activity diagram. (10 marks)

b) Draw an Activity Diagram for ordering: browse → add to cart → checkout → payment → confirmation. (10 marks)

Question 3:

A hotel management system must track rooms, guests, reservations, and payments.

a) Explain the purpose of class diagrams in system design. (10 marks)

b) Draw a Class Diagram showing Room, Guest, Reservation, and Payment classes with relationships. (10 marks)

Question 4:

A university library manages books, students, staff, and book loans.

a) Describe the role of ERDs in database design. (10 marks)

b) Draw an ERD showing entities Book, Student, Staff, and Loan with correct cardinalities. (10 marks)

Question 5:

A university wants to develop an Integrated Student Services System to manage student registration, course enrolment, fee payments, hostels, and exam results. Currently, the departments operate independently, causing delays, missing records, and poor coordination.

a) Identify and discuss five key problems the new system must solve.

(5 marks)

b) Describe five functional requirements and five non-functional requirements suitable for this system.

(10 marks)

c) Explain how the system analyst would use requirements-gathering techniques in this project.

(5 marks)

Question 6:

A user orders food from a delivery app that communicates with a restaurant and payment gateway.

a) Explain how sequence diagrams help model system interactions. (10 marks)

b) Draw a Sequence Diagram showing interactions among User → System → Restaurant → Payment Gateway. (10 marks)

Question 7:

A security system manages door access through card authentication.

a) Explain when state chart diagrams are useful. (10 marks)

b) Draw a State Chart Diagram showing: Idle → Read Card → Validate → Grant Access → Lock. (10 marks)

Question 8:

A bank wants to upgrade its ATM software.

a) Explain the relevance of SDLC in managing software development projects. (10 marks)

b) Discuss any five SDLC phases and how they apply to the ATM upgrade. (10 marks)

Question 9:

Consider a project to develop a Smart Agricultural Monitoring System.

a) Explain any five requirements gathering techniques. (10 marks)

b) Discuss the suitability of each technique for this agricultural system. (10 marks)

Question 10:

A logistics company wants to automate vehicle tracking.

a) Explain the importance of a feasibility study. (10 marks)

b) Discuss five types of feasibility the analyst should conduct, with relevance to this project. (10 marks)

Question 11:

A tech startup is designing an e-wallet system.

a) Distinguish between system analysis and system design. (10 marks)

wallet system. (10 marks)

Question 12:

A manufacturing company needs a production management system.

a) Explain the difference between a context diagram and level-1 DFD. (10 marks)

b) Draw a context diagram for the production system. (10 marks)