2920/201
SYSTEMS ANALYSIS AND DESIGN
June/July 2023
Time: 3 hours

THE KENYA NATIONAL EXAMINATIONS COUNCIL

DIPLOMA IN INFORMATION COMMUNICATION TECHNOLOGY

MODULE II

SYSTEMS ANALYSIS AND DESIGN

3 hours

INSTRUCTIONS TO CANDIDATES

This paper consists of EIGHT questions.
Answer any FIVE of the EIGHT questions in the answer booklet provided.
All questions carry equal marks.
Candidate to answer the questions in English.

This paper consists of 4 printed pages.

Candidates should check the question paper to ascertain that all the
pages are printed as indicated and that no questions are missing.

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1. (a) (i) Define functional requirements as used in system development.
(2 marks)

      (ii) Explain **two** items that could be captured when formulating a problem statement. (4 marks)

    (b) Differentiate between *process oriented* and *data-oriented* system design models. (4 marks)

    (c) Pius used a decision table to design elementary process descriptions. Outline **four** rules followed in this design tool. (4 marks)

    (d) Sharon implemented an Information System at a client's site. Describe **three** types of testing likely to be carried out at this site. (6 marks)

2. (a) Outline **four** roles of a system analyst. (4 marks)

    (b) Explain **two** cloud computing services that support Information Systems. (4 marks)

    (c) Duncan intends to design a questionnaire for data gathering. Explain **three** considerations he could make when formulating the questions. (6 marks)

    (d) Noela developed an Information System for a company. Explain the criteria she could have used when selecting the development methodology. (6 marks)

3. (a) Outline **four** importance of system maintenance. (4 marks)

    (b) Daniel used Structured System Analysis and Design Methodology (SSADM) to develop an Information System. Explain **three** characteristics of this methodology. (6 marks)

    (c) Differentiate between *program* and *system* specifications as used in system development. (4 marks)

    (d) Marvech Company invested in a project with a 4-year life span. The initial cost was 54000 and annual cash inflows were 20,000 for year 1; 22,000 for year 2; 27,000 for year 3 and 30,000 for year 4. Assuming 10% rate of return, determine the viability of this project using the Net Present Value (NPV) method. (6 marks)

4. (a) Explain evolutionary prototyping as used in system development. (2 marks)

    (b) With the aid of a sketch in each case, describe the following system flowchart components:

      (i) database; (2 marks)

      (ii) manual input. (2 marks)

    (c) Techways added a new module to an existing Information System.

      (i) Identify this type of system maintenance. (2 marks)

      (ii) Explain **two** challenges encountered when conducting the maintenance identified in (i). (4 marks)

(d) Table 1 shows activities and duration for an ICT project.

Activity	Precedence	Duration (Weeks)
A	----	6
B	A	4
C	A	5
D	B	6
E	C	3
F	D, E	4

Table 1

    (i)   Draw a network diagram showing Earliest Start Time (EST) and Latest Start Time (LST) for the project. (5 marks)

    (ii)   Determine the critical path for this project. (3 marks)

5. (a) Describe **two** system acquisition methods that do not result to complete transfer of ownership. (4 marks)

(b) Differentiate between *data element* and *data store* as used in a data dictionary. (4 marks)

(c) Melanie developed dialog forms for an Information System. Explain **three** input methods she could use. (6 marks)

(d) Duncan has been appointed as an ICT project manager. Explain **three** roles that he could play. (6 marks)

6. (a) Outline **two** user training methods for an Information System. (2 marks)

(b) (i) Describe **two** types of systems classified according to interaction with the environment. (4 marks)

    (ii)   A company intends to acquire an Information System. Outline the criteria the company could use to determine the acquisition method. (4 marks)
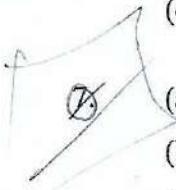
(c) Maxis performed an audit for an Information System that had failed. Explain **two** possible causes of this failure other than cost. (4 marks)

(d) FairChore Logistics uses Information Systems for the senior management. Describe **three** examples of such systems. (6 marks)

7. (a) Outline **two** reasons for using spiral model in system development. (4 marks)

(b) Describe **three** file organization methods for an Information System. (6 marks)

(c) Differentiate between *critical* and *dummy* activities in project management. (4 marks)

(d) To qualify for a loan from a lending organization, the following conditions are considered; Age>18 years, income earned greater than amount to borrow and CRB status ok. Loan is approved if all conditions are met, otherwise loan is declined.

Draw a limited entry decision table to represent this logic. (6 marks)

8. (a) Outline **two** goals of system security. (2 marks)

(b) (i) Explain **three** importance of evaluating an Information System after implementation. (6 marks)

(ii) Differentiate between *legal* and *social* feasibility. (4 marks)

(c) Explain **two** reasons for using PERT charts in project management. (4 marks)

(d) A clerk in a hospital uses a transaction processing system. Outline **four** tasks she can perform with this system. (4 marks)

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