2920/201
SYSTEMS ANALYSIS AND DESIGN
July 2016
Time: 3 hours

THE KENYA NATIONAL EXAMINATIONS COUNCIL

DIPLOMA IN INFORMATION COMMUNICATION TECHNOLOGY

SYSTEMS ANALYSIS AND DESIGN

3 hours

INSTRUCTIONS TO CANDIDATES

Answer any **FIVE** *of the following* **EIGHT** *questions in the answer booklet provided.*
ALL questions carry equal marks.
Candidates should answer the questions in English.

This paper consists of 5 printed pages.

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

Turn over

1. (a) Outline **three** roles of non functional requirements in system development. (3 marks)

    (b) (i)   Explain the term *dataset* as used in information systems. (2 marks)

        (ii) Outline **three** roles of a system implementer in system development. (3 marks)

    (c) Explain **three** benefits that could be realized when using state transition diagrams during system design. (6 marks)

    (d) With the aid of illustration in each case, outline each of the following type of relations:

        (i)   one-to-one (2 marks)

        (ii) one-to-many (2 marks)

        (iii) many-to-many. (2 marks)

2. (a) Outline **two** negative impacts of emerging trends in systems analysis and design. (2 marks)

    (b) Sammy intends to use object-oriented methodology for a proposed information system in his company. Explain **three** typical features that he could realize while using the methodology. (6 marks)

    (c) Daisy was required to identify possible causes of project slippage. Outline **four** threats that she could have identified. (4 marks)

    (d) (i)   Lazarus intends to use payback method to evaluate a proposed project in his company. Explain **two** limitations of the method. (4 marks)

        (ii) Risk management requires several strategies in organizations. Explain **two** strategies that could be used. (4 marks)

3. (a) (i)   Outline **two** advantages of using Jackson Systems Development (JSD). (2 marks)

        (ii) Outline **three** factors that should be considered when selecting systems development methodology. (3 marks)

    (b) (i)   Outline **two** typical components of an information system. (2 marks)

        (ii) Differentiate between *test data* and *test case* as applied in system testing. (4 marks)

    (c) Miriam has decided to use program flow charts to design an IS. Outline **three** disadvantages of this tool. (3 marks)

    (d) A team of system developers were allocated several independent modules to design and develop. Assume you are hired as a system analyst in the company.

        (i)   Identify the most appropriate type of testing they could apply. (2 marks)

        (ii) Explain **two** strengths of the testing identified in (i). (4 marks)

4. (a) (i)   Explain the term *feedback* as applied in system control. (2 marks)

        (ii) Outline **two** characteristics of a deterministic system. (2 marks)

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(b) (i) Outline **two** file processing methods. (2 marks)

(ii) Differentiate between *probability* and *non probability* sampling as applied in data collection. (4 marks)

(c) Rose intends to carry out file conversion for a new information system. Explain **two** methods she could use to accomplish the task. (4 marks)

(d) Master-bits Systems Ltd. intends to use on job training for its client. Explain **three** advantages of the training method. (6 marks)

5. (a) Differentiate between *economical* and *technical* feasibility studies. (4 marks)

(b) With the aid of a diagram, describe ELH for a typical library system. (6 marks)

(c) Collins intends to formulate a user guide for his client's proposed information system. Outline **four** guidelines that he should use. (4 marks)

(d) A structured walkthrough is a meeting for a group of peers to review and discuss the technical aspects of system development. Explain **three** objectives of such meetings in organizations. (6 marks)

6. (a) Explain the term *license key* as applied in system acquisition. (2 marks)

(b) Explain **two** disadvantages of questionnaires. (4 marks)

(c) (i) With the aid of examples in each case, explain **two** methods of system acquisition. (4 marks)

(ii) Differentiate between a *project scope* and a *project cycle* as applied in project management. (4 marks)

(d) Patrick was required to carry out training of users for a new information system in an organization.

(i) Explain the most appropriate category of users that should be the last to be trained as per organizational structure. (2 marks)

(ii) Explain **two** challenges that are likely to be experienced during the training. (4 marks)

7. (a) Outline **two** typical indicators for urgent system review. (2 marks)

(b) Explain each of the following terms as applied in project management:

(i) milestone (2 marks)

(ii) deliverable. (2 marks)

(c) Baraka was required to install an information system in a new company.

(i) Identify the most appropriate changeover strategy that he could use justifying your answer. (2 marks)

(ii) Explain **two** advantages of the changeover strategy identified in (i). (4 marks)

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Turn over

(d) Read the following narrative to answer the question that follows.

Makutano Dairy Farmers Sacco intends to develop an information system that will automate its operations. Farmers are required to fill registration form and return them to the clerk's office. The clerical officer then keys in, verifies and then stores farmer's details in verified details files. The verified farmers are issued with registration numbers and passwords that are then stored in credentials file. During the milk delivery, farmers provide the registration number to the clerical attendant to enable the system retrieves his/her files. After weighing the milk, the farmer file is updated by clerical officer and a transaction receipt issued to that farmer, transaction receipt details are then stored in transaction file. At the end of the month, the accountant of the Sacco is required to process farmer's payment by subtracting stores credit from the farmer's income. The accountant is then required to debit farmers bank account with the net balance and then update all records for that month.

Draw a level 1 dataflow diagram to model the narrative into a system. (8 marks)

8. (a) Explain **two** advantages of throw-away prototyping. (4 marks)

(b) Sophia was required to enhance an existence IS because of a newly installed operating system.

(i) Identify the type of maintenance she would carry out. (2 marks)

(ii) Explain **two** challenges that she could experience with the type of maintenance identified in (i). (4 marks)

(c) Table 1 shows activities and durations for an information system project. Use it to answer the questions that follow.

Activity		Predecessor	Duration
A	Site survey	-	3
B	Feasibility report	A	4
C	Write proposal	-	4
D	Presentation meeting	B,C	8
E	Write quotation	B,C	5
F	Sign contract	E	3
G	Design	D	3
H	Implementation	F,G	3
I	Testing and training	H	3

Table 1

(i) Draw a network diagram to represent the project activities. (8 marks)

(ii) Show the critical path of the project. (2 marks)

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