

2920/201
SYSTEM ANALYSIS AND DESIGN
July 2022
Time: 3 hours



THE KENYA NATIONAL EXAMINATIONS COUNCIL
DIPLOMA IN INFORMATION COMMUNICATION TECHNOLOGY

MODULE II

SYSTEM ANALYSIS AND DESIGN

3 hours

INSTRUCTIONS TO CANDIDATES:

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

1. (a) (i) Explain the cause of scope creep during System Development. (2 marks)
(ii) Outline **four** advantages of an expert system. (4 marks)
- (b) Differentiate between *structured* and *unstructured* decisions as used in systems theory. (4 marks)
- (c) Describe **two** data elements that could be included in a data dictionary. (4 marks)
- (d) Mara intends to design input and output interface for an Information System. Describe **three** types of interfaces she could use. (6 marks)
2. (a) Outline **two** examples of external problem indicators in the development of an Information System. (2 marks)
- (b) Describe each of the following System Development methodologies:
(i) structured; (2 marks)
(ii) object-oriented. (2 marks)
- (c) (i) Marcus prepared a requirement specification document for a proposed system. Explain **two** importance of this document during system development. (4 marks)
(ii) Differentiate between *critical* and *dummy* activities as used in ICT project management. (4 marks)
- (d) A company hired a system analyst to train staff on the use of a new Information System. Describe **three** methods of training that he could use. (6 marks)
3. (a) Outline **four** roles of a project manager in ICT project management. (4 marks)
- (b) (i) Explain the term system thinking. (2 marks)
(ii) A system analyst was reviewing an Information System at design stage. Explain **two** characteristics that this design should possess. (4 marks)
- (c) Distinguish between *straight* and *phased* file conversion methods as used in system implementation. (4 marks)
- (d) A supermarket has a reward system for its loyal customers. If a customer purchases goods worth shs. 30,000 or more, and the loyalty card has more than 3,000 points, the customer is awarded a voucher worth shs. 5,000 or a voucher worth shs.2,000 if the card has less than 3,000 points. The transaction is stored in a file and a report generated. Draw a system flowchart to represent this logic. (6 marks)
4. (a) Outline **two** advantages of using CASE tools during system analysis. (2 marks)
- (b) (i) Explain the term break-even point as used in feasibility study. (2 marks)
(ii) Distinguish between *evolutionary* and *throw away* prototypes. (4 marks)
- (c) With the aid of a diagram, describe the stages in system development cycle using the waterfall model. (6 marks)

- (d) A system analyst conducted a feasibility study on a project and concluded the following; the system would not be operationalized in year 0, it would be implemented in year 1 and the profit for that year would be shs. 60, 000. The benefits would increase by shs. 15, 000 from year 2 to year 5. The overall development cost would be shs.50, 000 while running costs would be shs. 8,000 per year. Using Return on Investment (ROI), determine the viability of this project. (6 marks)

5* (a) (i) Explain the term acceptance testing as used in System Development. (2 marks)

(ii) A company uses an online system to capture data from its potential customers. Recently, several complains were received from a customer with regard to their input form design. Outline four reasons for these complaints. (4 marks)

(b) UBZ Company implemented a new system in one department while the other departments continued to use the old system.

(i) Identify this system implementation method. (1 mark)

(ii) Outline three advantages of the method identified in (i). (3 marks)

(c) Melissa used interviews to collect data during system investigation.

(i) Outline two challenges of using this method only. (2 marks)

(ii) Describe two other appropriate methods she could use to verify the data collected. (4 marks)

(d) Clifford prepared a Gantt chart for a proposed ICT project. Explain two significance of this tool to the project team. (4 marks)

6* (a) Outline two measures that could be considered to deal with rapid technology changes in Information Systems. (2 marks)

(b) (i) Describe two contents of a technical documentation. (4 marks)

(ii) A company intends to acquire an Information System. Describe two acquisition methods the company could use. (4 marks)

(c) Dany designed a database for an Information System. Describe two database models he could have used. (4 marks)

(d) Ufumo Dairies is a retail store that offer goods such as cereals and animal feeds to dairy farmers who are members of Wakulima Farmers' Cooperative Society. A new member is required to provide their details which are stored in the members file. The details are verified against a file link from Cooperative Society system. Once verified a member is issued with a membership card and a notification sent to his/her phone. A member uses the card to purchase goods on credit and this information is stored in a credit file. The amount of money owed is computed monthly and sent to the Cooperative Society system. The Society deducts the money against the milk deliveries and sends a payment schedule. The member is notified to the phone and credit file is updated.

Draw a level 1 data flow diagram to represent this logic. (6 marks)

- 7.4 (a) (i) Outline **two** challenges a user could experience when using an Information System without an accompanying manual. (4 marks)
- (ii) Explain the term coupling as used in system design. (2 marks)
- (b) Differentiate between *condition stub* and *action stub* as used in a decision table. (4 marks)
- (c) Marvel Company made some changes to their information system to accommodate a new product.
- (i) Identify the type of system maintenance used. (1 mark)
- (ii) Explain **two** disadvantages of the maintenance identified in (i). (4 marks)
- (d) A student is classified either as needy or not needy. If a student is not needy, no bursary is awarded. If needy, student discipline record and performance is considered. A needy student whose performance is a Credit and above is awarded Shs. 20,000 bursary, otherwise the student is awarded Shs. 10,000. A student with discipline issues is not awarded a bursary.

Draw a decision tree to represent this logic. (5 marks)

- 8.4 (a) Explain the term attribute as used in database design. (2 marks)
- (b) (i) Outline **three** importance of a system post implementation review. (3 marks)
- (ii) Outline **three** circumstances that would make an ongoing ICT project to stop. (3 marks)
- (c) A system analyst identified a number of ways in which users interact with an information system.
- (i) Name the type of system approach used. (1 mark)
- (ii) Outline **three** properties of the approach named in (i). (3 marks)
- (d) Table 1 shows activities predecessor and duration of an ICT project. Use it to answer the questions that follow.

Activities	Predecessor	Duration (Weeks)
A	_____	5
B	_____	4
C	A	3
D	B	4
E	B	3
F	_____	9
G	E, F	3
H	C, D	2

Table 1

- Draw a network analysis diagram for the project (6 marks)
- (i) Determine the critical path for the project. (2 marks)

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