

2920/201
SYSTEMS ANALYSIS AND DESIGN
November 2021
Time: 3 hours



THE KENYA NATIONAL EXAMINATIONS COUNCIL
DIPLOMA IN INFORMATION COMMUNICATION TECHNOLOGY

MODULE II

SYSTEMS ANALYSIS AND DESIGN

3 hours

INSTRUCTIONS TO THE CANDIDATE:

*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.*

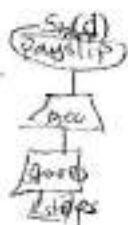
This paper consists of 5 printed pages.

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

- 1 ✓ (a) State **four** items that could be included in a Terms of Reference (TOR) document. (4 marks)
- (b) Differentiate between *open* and *closed* system. (4 marks)
- (c) Mark, a System Analyst, conducted a technical feasibility study for an Information System. Explain **two** requirements he could have considered. (4 marks)
- (d) (i) Janet developed a database for an Information System. Describe **two** models she could have used to develop the database. (4 marks)
- (ii) Describe **two** methods that could be used to capture data directly into a database. (4marks)

- 2 ✓ (a) Outline **four** rules followed when drawing data flows in a data flow diagram. (4 marks)
- (b) (i) Describe **two** prototyping techniques used during system development. (4 marks)
- (ii) Differentiate between *limited entry* and *extended entry* decision tables. (4 marks)
- (c) Bidii Company intends to develop a new Information System. Outline **four** reasons that could have led to this consideration. (4 marks)
- (d) Joan used questionnaire and interview method to collect data for a new Information System. Describe **two** methods she should use to verify the accuracy of this data. (4 marks)

- 3 ✓ (a) Describe Structured System Development Methodology. (2 marks)
- (b) Explain the importance of system design. (4 marks)
- (c) Describe **two** stages of System Development Life Cycle (SDLC) that are carried out on a fully developed system. (4 marks)



- (d) Shujaa Company generates employees' payslip using a payroll system. The system accepts hours worked and computes the gross pay given a rate of Ksh. 500 per hour. The system then stores this information in a payment file.
- (i) Represent this logic in a system flowchart. (6 marks)
- (ii) Explain **two** limitations of using a flowchart to design a system. (4 marks)

- 4 ✓ (a) Explain **two** advantages of decomposing a system into modules. (4 marks)
- (b) Techdada Company hired a system analyst. Outline **four** tasks she is likely to perform. (4 marks)
- (c) Masomo College uses the following procedure to process an application for admission. An application is received and the system checks whether an application fee has been paid. If paid, the system checks whether the course applied for has a vacancy. If vacancy is available and fee is paid, an admission letter is generated, else a message to pay is sent to the applicant. Otherwise, a regret letter is generated.
- Draw a decision tree to represent this logic. (6 marks)

- (d) Felix created a data dictionary for an Information System. Explain the importance of this tool. ✓ (6 marks)
5. (a) Outline **four** physical security measures enforced to secure an Information System. (4 marks)
- (b) Differentiate between *formative* and *summative* evaluations as used in system review. (4 marks)
- (c) Henry, a system administrator, trained users of a new Information System.
- (i) State **two** categories of such users. (2 marks)
- (ii) Explain **two** methods of training he could have used. (4 marks)
- (d) Figure 1 represents a network diagram for an ICT project. Use it to answer the question that follows.

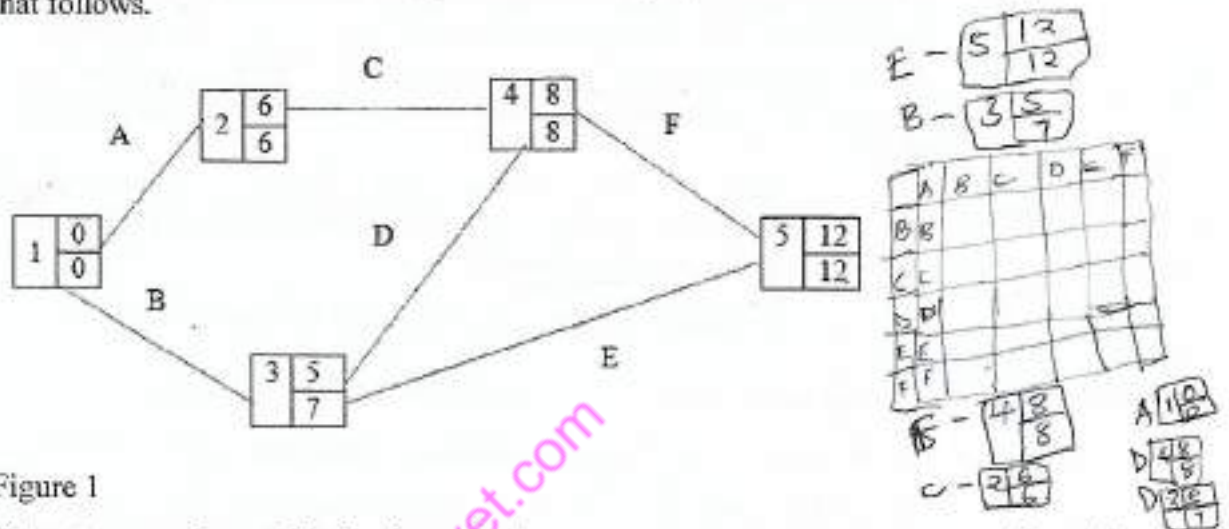


Figure 1

Extract a precedence table for the project.

- (a) Outline **four** characteristics of a Management Information System (MIS). (4 marks)
- (b) Differentiate between *leasing* and *outsourcing* system acquisition methods. (4 marks)
- (c) A system analyst recommended an addition of new features to an existing system.
- (i) Identify this type of system maintenance. (1 mark)
- (ii) Outline **three** reasons that could have led to this recommendation. (3 marks)
- (d) Table 1 shows data for an ICT project. Use it to answer the questions that follow.

Year	Net profit Kshs ('000)
1	20
2	40
3	40
4	30
5	30

Table 1

- (i) Given that the initial cost is Ksh 100,000 and a discount rate of 10%. Determine the viability of the project using Net Present Value (NPV). (6 marks)
- (ii) Outline **two** disadvantages of using this method. (2 marks)

(a) Explain each of the following terms as used in system documentation:

- (i) user manual; (2 marks)
- (iii) test data. (2 marks)

(b) Differentiate between *functional* and *non-functional* requirements as used in system analysis. (4 marks)

(c) A system development team completed an ICT project as planned. Explain **three** measures taken to ensure this successful completion. (6 marks)

(d) The government intends to automate all its services by registering all its citizens. Adult fill a form with their details and those of dependants which are stored in a citizen file. These details are verified against the national identity register and birth register respectively. A passport size photo for each citizen is uploaded and stored in images file.

Once the details are verified a service card is processed and the adult citizen is notified through an SMS to collect the card. The citizen then signs a digital register and the details are stored in a signature file.

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

(a) Outline **four** contents of an ICT project initiation document. (4 marks)

(b) Differentiate between *boundary* and *environment* as used in systems. (4 marks)

(c) Figure 2 depicts organizational levels of management. Use it to answer the questions that follow.

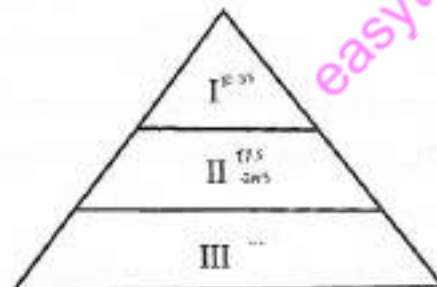


Figure 2

- (i) Outline **one** information need for each level. (3 marks)
- (ii) State the type of decision made at each level. (3 marks)

- (g) Figure 3 shows an Entity Relationship Diagram (ERD) for a library system. Use it to answer the questions that follow.

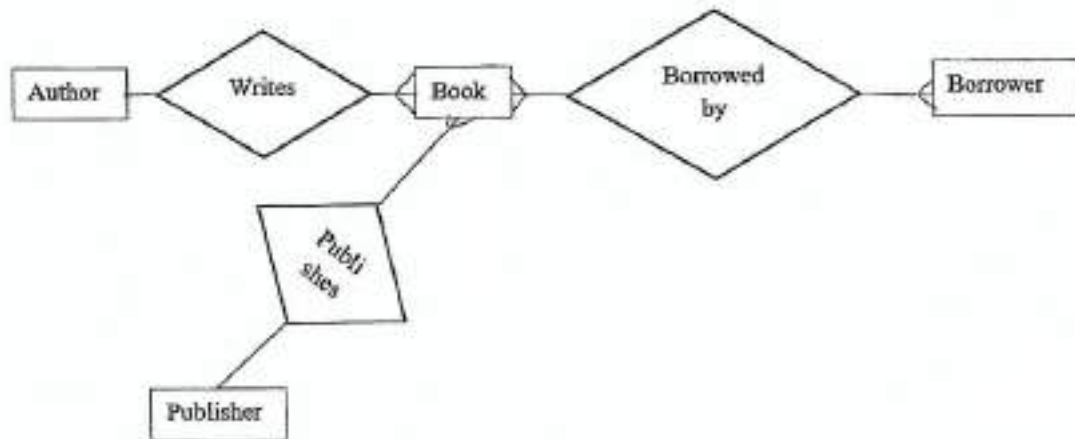


Figure 3

- (i) Describe **two** types of relationships depicted in the figure. (4 marks)
- (ii) Explain **one** challenge likely to be experienced when implementing this tool. (2 marks)

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