

2920/201
SYSTEMS ANALYSIS AND DESIGN
July 2018
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 following EIGHT questions in the answer booklet provided.
Candidates should 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.

1. (a) (i) Outline **two** limitations of *traditional* system development methodologies. (2 marks)
- (ii) Differentiate between *table of contents* and *references* as used in systems documentation. (4 marks)
- (b) (i) Outline **two** objectives of a walkthrough meeting. (2 marks)
- (ii) Outline **three** advantages of using Jackson Systems development (JSD). (3 marks)
- (c) Design a typical examination system using structured charts. (3 marks)
- (d) Peter has been requested to develop a training plan for system users. Explain **three** elements expected in the plan. (6 marks)
2. (a) Outline **two** challenges of adopting software as a service (SaaS) in an organization. (2 marks)
- (b) Explain **two** categories of stakeholders in an Information System project. (4 marks)
- (c) Rose used open questions to design a survey to gather detailed user understanding about a problem under investigation. Explain **three** disadvantages of this type of questions as used in the survey. (6 marks)
- (d) (i) With the aid of diagrams, outline **two** file organization methods that could be used in Information Systems. (4 marks)
- (ii) Bonnie opines that the existing Information System is destined for failure. Outline **four** signs that could have informed his opinion. (4 marks)
3. (a) Define the term *task dependencies* as used in a project. (2 marks)
- (b) Explain **two** factors that should be considered while creating a *term of reference* for an Information System project. (4 marks)
- (c) (i) Differentiate between a *throw-away* prototype and *evolutionary* prototype. (4 marks)
- (ii) Paul was required to design a data input form for an Information System. Explain **two** data accuracy measures that he could implement in the form design. (4 marks)
- (d) Luke was required to investigate whether a new Information System addressed all requirements of a client.
- (i) Identify the most appropriate testing method that he could use, justifying your answer. (2 marks)
- (ii) Explain **two** advantages that the client would realize after carrying out the testing method identified in (i). (4 marks)
4. (a) With the aid of a diagram, describe **two** components of a Data Flow Diagram. (4 marks)
- (b) Differentiate between *requirement specification* and *system specification*. (4 marks)

- (c) 5Gate Bank Ltd. intends to develop a mobile banking system. The proposed system will allow customers to open accounts, deposit, withdraw and perform bank transfers using their phone. Assume you are hired as system analyst with the bank, use a use-case diagram to represent the logical design for the proposed system. (6 marks)
- (d) State transition diagram are widely used in design of online Information Systems. Explain **three** advantages that could be influencing this trend. (6 marks)
- 4.5. (a) (i) Explain the term *meta data* as used in Information System design. (2 marks)
- (ii) Explain **two** methods that could be used to acquire an Information System. (4 marks)
- (b) CR-B Company Ltd. intends to review its Information System so as to address new user needs.
- (i) Identify the type of system maintenance. (2 marks)
- (ii) Explain **two** precautions for type of maintenance identified in (i). (4 marks)
- (c) Table 1 shows activities and durations for a system-testing project. Use it to answer the questions that follow.

Activities	Predecessor	Duration
A Test plan	-	1
B Test data	A	2
C Generate test engine	-	2
D Perform testing	B,C	13
E Compile testing result	B,C	4
F Analyze testing results	E	9
G System review	D,F	1

Table 1

- (i) Draw a network diagram showing the earliest start times (EST) and latest start times (LST). (6 marks)
- (ii) Determine the critical path for the project. (2 marks)
6. (a) (i) Describe an *entity lift history* (ELH) as used in system development. (2 marks)
- (ii) Outline **three** benefits of using a *work breakdown structure* (WBS) in project management. (3 marks)
- (b) Outline **three** conditions that will justify use of a spiral model during system analysis and design. (3 marks)
- (c) Margaret was required to use several keys when designing tables in database information system for her company. Explain **three** types of keys that she could use. (6 marks)
- (d) Draw a limited entry decision table to represent the following course selection processes.
- Wetu Technical College intends to shortlist students' applicants for a diploma course in Information Communication Technology. Applicants should have scored at least C-mean grade in KCSE and at least scored grade C in both, Mathematics and English. (6 marks)

7. (a) Outline **two** typical goals of system design. (2 marks)
- (b) Distinguish between *contingency* and *fallback plan* as used in project management. (4 marks)
- (c) Dema-P Company Ltd. intended to introduce a prototype of a proposed Information System that will be tested with users while they continue doing their work using its legacy Information System.
- (i) Identify the changeover strategy used. (2 marks)
- (ii) Outline **four** advantages of the changeover strategy identified in (i). (4 marks)
- (d) Read the following narrative to answer the question that follows.

Hazina Technical Institute intends to set up a policy document for malpractice cases in student's term reports. A student who is suspected of plagiarizing his/her work would first be summoned by a subject lecturer for a chat to establish the authenticity of sources of references on affected reports.

Based on the outcome of the chat, the lecturer would then decide whether there is an academic dishonesty case to answer. If the lecturer attests that there is an academic dishonesty, there would be a case to answer. Hence, the lecturer would check student academic record for a similar case and if found the student would be referred to the Principal, a week suspension and a subsequent meeting with academic committee on reporting date.

However, if it is a first case the lecturer is supposed to get an approval from Dean of studies for the appropriate punishment that would be endorsed and a letter written to the student. A student would then choose to accept or appeal the finding of the Dean of studies. On acceptance he/she proceeds to carry out the punishment and the case is closed. Otherwise, if he/she chooses to appeal, he will meet the academic committee for the hearing of the case in line with the Institute's academic policy before the case gets closed.

Draw a program flow chart to model the narrative into a system. (8 marks)

8. (a) (i) Outline **two** types of system users. (2 marks)
- (ii) Differentiate between *data* and *information* as used in systems analysis and design. (4 marks)
- (b) (i) Describe an *expert system*. (2 marks)
- (ii) State **two** factors that should be considered when acquiring a new Information System, other than cost. (2 marks)
- (c) Maria intends to investigate the characteristics of an open loop control system. Outline **four** characteristics that she could establish. (4 marks)
- (d) A lecturer described components of an Information System to a SAD class. Explain **three** components that he could have mentioned to the class. (6 marks)

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