

2920/201  
SYSTEMS ANALYSIS AND DESIGN  
November 2017  
Time: 3 hours



THE KENYA NATIONAL EXAMINATIONS COUNCIL  
DIPLOMA IN INFORMATION COMMUNICATION TECHNOLOGY

MODULE II

SYSTEMS ANALYSIS AND DESIGN

3 hours

INSTRUCTIONS TO THE CANDIDATES

*Write your name and index number in the answer booklet provided.  
Answer any FIVE of the following EIGHT questions in the answer booklet.  
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** responsibilities of a system analyst in an organization. (2 marks)  
(ii) Differentiate between *structured* and *unstructured* interviews. (4 marks)
- (b) (i) Describe a *knowledge base system*. (2 marks)  
(ii) State **two** desirable characteristics of internal documentation of a program. (2 marks)
- (c) With the aid of a diagram, describe a closed control system. (4 marks)
- (d) Transaction processing systems play a vital role in organizations. Explain **three** typical features of these systems that make them inevitable in organizations. (6 marks)
2. (a) (i) Explain the importance of pseudo code in system design. (2 marks)  
(ii) Outline **three** causes of project schedule slippage. (3 marks)
- (b) Outline **three** limitations of using waterfall model in systems development. (3 marks)
- (c) With the aid of diagrams, describe **two** types of relationships used in Entity relationship diagram (ERD). (6 marks)
- (d) Most software developers are adopting objects oriented analysis and design. Explain **three** typical features associated with this methodology. (6 marks)
3. (a) Define the term *resource* as used in project management. (2 marks)
- (b) (i) Describe **two** key components of a terms-of-reference document in information system projects. (4 marks)  
(ii) Differentiate between *portability* and *compatibility* qualities as used in system design. (4 marks)
- (c) Sarah was required to select a system development method for a proposed information system for her company. Outline **four** factors that she should consider in order to select an appropriate methodology. (4 marks)
- (d) Charlie intends to validate an information system by tracing the system code.  
(i) Identify the most appropriate type of test that he could apply. (2 marks)  
(ii) Explain **two** challenges he could likely encounter while using the type of test identified in (i). (4 marks)
4. (a) (i) With the aid of a diagram, describe **two** symbols used in use case diagrams. (4 marks)  
(ii) Use case diagrams are popular in system analysis. Describe **three** advantages of the tool that could be influencing this trend. (6 marks)
- (b) Differentiate between *legal* and *operational* feasibility studies. (4 marks)
- (c) Mobile application developers employ prototyping to solve user problems. Describe **three** types of prototypes used in this industry. (6 marks)

5. (a) (i) Explain the term *bespoke system* as applied in system acquisition. (2 marks)
- (ii) Explain **two** uses of system documentation. (4 marks)
- (b) Marek Company Ltd. installed modern computers in all its offices but the existing information system could not be installed in the new computers. Assume you are hired as system analyst.
- (i) Describe the type of maintenance that you would recommend for the information system. (2 marks)
- (ii) Explain **two** risks associated with the 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.

Activities	Predecessor	Duration
A Proposal	-	3
B Prototyping	A	3
C User needs engineering	-	3
D Quotation and contract signing	B,C	5
E Implantation of prototype	A	5
F Commissioning of new system	DE	10
G Review meeting	D	7
I Close of project	EG	2

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) Outline **two** goals of usability in system design. (2 marks)
- (b) Explain **two** factors that should be considered when formulating a risk plan in a project. (4 marks)
- (c) Barbra was hired to develop and thoroughly test an information system for a client that did not have an existing information system.
- (i) Identify the changeover strategy that she could use. (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.
- Mazao watering company intends to develop a system that would automate its operations. Customers are required to sign up for an account in the company's website which prompts them to fill in registration details, the submitted forms are stored in members file in the server located in the head office.
- Members are then required to verify their account using the link provided in an email that was sent to by the server. Upon verification their details is then stored in the verification file.

The verified members login the company's website using their credential and select the types of transaction such as payment, print statement, customer care and suggestions box.

After the completion of the transaction, a transaction receipt is printed and transaction file updated.

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

7. (a) (i) Outline **two** data capturing methods that could be used in an information system. (2 marks)
- (ii) Differentiate between *user guide manual* and *technical manual* as used in systems documentation. (4 marks)
- (b) (i) Outline **two** participants that could be invited for a structured walkthrough meeting. (2 marks)
- (ii) Outline **three** reasons that could influence a system designer to use functional decomposition. (3 marks)
- (c) Decision trees are commonly used by system analysts. Outline **three** strengths of this tool that could be influencing this trend. (3 marks)
- (d) Robert intends to train users of a new system using an online program.
- (i) Identify the training method that he would be using. (2 marks)
- (ii) Explain **two** benefits of using the training method identified in (i). (4 marks)
8. (a) Outline **two** requirements for the Software as a Service (SaaS) in an organization. (2 marks)
- (b) Explain **two** types of time estimates that could be used in a project network diagram. (4 marks)
- (c) Rose intends to collect data about an organization without the knowledge of the workers.
- (i) Explain the most appropriate data gathering technique that she could use. (2 marks)
- (ii) Explain **two** problems that she could experience while using the fact-finding method identified in (i). (4 marks)
- (d) (i) Jude intends to select a file organization method for an information system that he was designing for a client. Outline **four** factors that he should consider in the selection, other than cost. (4 marks)
- (ii) Research statistics indicates high rate of system project failures. Outline **four** possible causes of the failures. (4 marks)

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