

Candidate's Name: \_\_\_\_\_ Date of Examination: \_\_\_\_\_

Printing Paper

2920/201  
SYSTEMS ANALYSIS AND DESIGN  
July 2012  
Time: 3 hours

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THE KENYA NATIONAL EXAMINATIONS COUNCIL



DIPLOMA IN INFORMATION COMMUNICATION TECHNOLOGY

MODULE II

SYSTEMS ANALYSIS AND DESIGN

3 hours

INSTRUCTIONS TO CANDIDATES

Write your **name** and **index number** in the spaces provided above.  
Sign and write the **date of examination** in the spaces provided above.  
Answer any **FIVE** of the following **EIGHT** questions in spaces provided.  
All questions carry equal marks

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Question	1	2	3	4	5	6	7	8
Marks								

TOTAL MARKS

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This paper consists of 11 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** components of an information system. (2 marks)

- 1) Technology: <sup>The software & hardware knowledge for</sup> hardware, software
  - 2) Hardware
  - 3) Software
  - 4) Data
- / People  
processors

(ii) Outline **two** roles of a system designer in an organization. (2 marks)

(b) (i) State **four** indicators of an information system that is about to be obsolete. (2 marks)

- 1) The system's maintenance history indicates that corrective maintenance is increasing steadily.
- 2) Operational cost or execution cost is increasing rapidly, and the routine perfective maintenance does not pay for itself.
- 3) New technology offers ways to perform the same or additional functions more efficiently.
- 4) Minimal change or additional are difficult to perform.

(ii) Differentiate between **data** and **information** as used in systems analysis. (4 marks)

(c) Explain **one** typical characteristic for each of the following categories of systems:

(i) open; (1 mark)

for external environment

(ii) closed; (1 mark)

eg self contained, can do not interact with environment

(iii) probabilistic; (1 mark)

- system has probable behaviour  
- A degree attached to what a system would do.

(iv) deterministic. (1 mark)

- operates in a predictable manner  
- interaction among parts known with certainty

(d) With the aid of an example in each case, describe the following type of questions that could be used when designing a questionnaire:

(i) open; (3 marks)

(ii) closed. (3 marks)

2. (a) (i) State **two** types interviews that could be used during fact finding. (1 mark)

(ii) Differentiate between *operational* and *legal* feasibility studies. (4 marks)

(b) Each of SDLC stage must produce an output. Outline the deliverable for each of the following stages:

(i) planning; (1 mark)

(ii) feasibility; (1 mark)

(iii) analysis; (1 mark)

(iv) design; (1 mark)

(v) implementation. (1 mark)

(c) Alex was required to write a report on top down analysis methodology. Outline **four** advantages that he is likely to have included in the report. (4 marks)

- (d) Axor Company Ltd. intends to use structured method to analyze a proposed information system. As the systems analyst, explain **three** factors you could consider before using this method. (6 marks)

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3. (a) (i) List **four** systems design methods that could be used in system development. (2 marks)

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- (ii) Outline **three** factors that should be considered when choosing system development methodologies. (3 marks)

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- (b) (i) Differentiate between *spiral* and *waterfall* systems development approaches. (4 marks)

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- (ii) Explain **three** advantages of using flow charts in systems analysis and design. (3 marks)

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

Today's Fashion Ltd. is a distributor of various high quality clothes. Customers place orders by emails, telephone, or company's website.

A sales representative who receives customer's order is supposed to verify if the items are in stock and immediately notify the customer. If some of the items are not found on the inventory control book the sales representative is then supposed to update the inventory file.

Once the customer order is verified the item and customer files are updated and an invoice is generated which is then sent to customer for payment.

On receiving the invoice, the customer deposits money to the company's bank account and sends an email to notify the accountant who then updates the payment file and customer file.

After confirmation of payment the company dispatches the items to customer's physical address together with a delivery note. A copy of delivery note is then filed upon a successful delivery.

Draw a Level 1 dataflow diagram to model the narrative into a system.

(8 marks)

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4. (a) (i) Explain **two** limitations of systems development life cycle. (4 marks)

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(ii) Explain the term *iteration* as used in system development life cycle. (2 marks)

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(b) Arc-Soft Ltd. was hired to train employees of a certain organization on how to use a newly implemented information system such that the normal operations are not disrupted.

(i) Identify the most appropriate training method that could be used. (1 mark)

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(ii) Outline **four** advantages of the training method identified in (i). (4 marks)

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(c) Table 1 shows net profits for project A and B respectively. The initial cost for the two projects was Kshs.180, 000 and Kshs.220, 000 respectively. Use it to answer the questions that follow.

Year	Project A		Project B	
	Net profit value (Ksh.)		Net profit value (Ksh.)	
1	20,000	30,000	30,000	40,000
2	25,000	35,000	35,000	46,000
3	30,000	40,000	40,000	46,000
4		45,000	45,000	46,000
5		50,000		46,000
Totals		200,000		224,000

(180,000 / 450,000) = 150

Table 1

(i) Determine the most worthwhile project using the *return-on-investment* technique.

(5 marks)

$$ROI = \frac{\text{Net Profit} - \text{Initial Cost}}{\text{Initial Investment}} = \frac{(150,000 - 180,000)}{50,000}$$
$$ROI = -60\%$$

(ii) Calculate the *payback* time for each project.

(4 marks)

③

5. (a) Outline **two** types of maintenance that could be applied on an installed system. (2 marks)

(b) Explain **two** factors that should be considered when choosing changeover strategy for a newly installed system. (4 marks)

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(c) Alex, a systems analyst with a certain software company, developed several modules that would be joined into single system.

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

Changeover strategy.

(ii) Explain **two** benefits of using the testing strategy identified in (i). (4 marks)

(d) (i) Joachim a systems analyst with Day-Soft Ltd. was instructed to prepare user documentation for a developed system. Explain **two** uses of documentation that could have influenced the instruction. (4 marks)

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(ii) Mamboleo Institute of Technology intends to acquire a student's online examination system. Explain ways in which the institute could use to achieve the objective. (4 marks)

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6. (a) (i) Outline **two** qualities of a good system document. (2 marks)

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(ii) Outline **three** responsibilities of a project manager during system development. (3 marks)

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(b) Explain **three** factors that could be considered when choosing system design tools. (6 marks)

*Hardware resources*  
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(c) With the aid of an example in each case, describe each of the following type of relationships:

(i) one-to-one; (3 marks)

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(ii) one-to-many; (3 marks)

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(iii) many-to-many. (3 marks)

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7. (a) State **four** challenges to systems development that are due to emerging trends. (2 marks)

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(b) For each of the following cases, identify the most appropriate type of prototyping justifying your answer:

(i) system user request to see how the final system will look after development; (2 marks)

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(ii) system user request to be able to use system model while it is being developed; (2 marks)

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(iii) system developer intends to design models of the proposed system. (2 marks)

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- (c) Table 2 shows activities and durations for a proposed system project. Use it to answer the question that follows.

	Activity	Predecessor	Duration
A.	Conduct interview	-	3
B.	Administer questionnaire	A	4
C.	Read company reports	-	4
D.	Analyze dataflow	B,C	8
E.	Introduce prototype	B,C	5
F.	Observe reaction to prototype	E	3
G.	Perform cost benefit analysis	D	3
H.	Prepare proposal	F,G	2
I.	Present proposal	H	2

Table 2

- (i) Draw a network diagram to represent the project activities. Show the EFT and LST for each activity. (8 marks)

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- (ii) Determine the critical path of the project. (2 marks)

- (iii) Outline **two** limitations of using this method in project management. (2 marks)

8. (a) Outline **two** strategies that could be used to mitigate project failure. (2 marks)

