higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE (VOCATIONAL)

SYSTEM ANALYSIS AND DESIGN
NQF LEVEL 3

(10041003)

2 March 2018 (X-Paper)
09:00–12:00

Nonprogrammable calculators may be used.

This question paper consists of 13 pages.

NCV

TIME: 3 HOURS
MARKS: 200

INSTRUCTIONS AND INFORMATION

1. Answer ALL the questions.
2. Read ALL the questions carefully.
3. Number the answers according to the numbering system used in this question paper.
4. Write neatly and legibly.

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SECTION A

QUESTION 1

1.1 Various options are given as possible answers to the following questions. Choose the answer and write only the letter (A–D) next to the question number (1.1.1–1.1.10) in the ANSWER BOOK.

1.1.1 A … system consists of rules and safety mechanisms designed to ensure that nothing goes wrong.

A production
B solar
C process control
D transaction processing

1.1.2 The purpose of information … is to ensure that all the appropriate control systems are in place and to provide adequate protection to the organisation and other affected parties.

A system audits
B systems facility controls
C system controls
D business systems

1.1.3 A ... is a user that has certain privileges to change or update information on a system.

A project manager
B system operator
C system designer
D system administrator

1.1.4 Computer equipment becoming obsolete over a period of time is a disadvantage of ...

A renting
B leasing
C outright purchase
D hiring

1.1.5 The means by which most organisations assess or evaluate the economic feasibility of an organisation's systems development project is called ...

A needs analysis feasibility
B cost-benefit analysis
C technical feasibility
D organisational feasibility

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1.1.6 Which type of organisational planning allows long-term and high-level schedules and budgets?

A strategic planning
B operational planning
C tactical planning
D informational planning

1.1.7 When an organisation is giving the same or even better products at a better price:

A cost advantage
B different advantage
C income advantage
D fixed advantage

1.1.8 ... refers to when and how costs and benefits will occur, and looks at the movement of money into and out of the organisation over a few years.

A breakeven point
B net present value
C operational cost
D cash flow

1.1.9 ... helps to protect computers and computer networks from unauthorised use and from hackers.

A encryption
B back-up
C a firewall
D anti-virus software

1.1.10 Is a computer program application that analyses business data and presents it so that users and management can make the right business choices.

A decision support system
B collaboration system
C database query system
D transaction processing system

(10 × 1) (10)

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1.2 Indicate whether the following statements are TRUE or FALSE. Choose the answer and write only 'true' or 'false' next to the question number (1.2.1–1.2.10) in the ANSWER BOOK.

1.2.1 Implementation is the actual construction, testing and installation of a functioning information system.

1.2.2 Microsoft Visio is an example of a software tool that allows users to create models and diagrams of software components.

1.2.3 The first four major phases of the systems development life cycle (SDLC) are the planning phase, the analysis phase, the design phase and the prototyping phase.

1.2.4 The planning phase includes maintaining and enhancing the system.

1.2.5 Feasibility analysis investigates economic, organisational, technical, resource and schedule feasibility.

1.2.6 A system is a collection of interrelated components that function together to achieve some outcome.

1.2.7 In iterative development, the system is grown and developed in phases.

1.2.8 Analysts must upgrade their knowledge and skills continually.

1.2.9 A systems analyst needs to understand people and the way they work.

1.2.10 Systems analysis and design focuses on understanding a business problem and outlining the approach to solve it.

(10 × 1) (10)

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1.3 Choose an item from COLUMN B that matches a description in COLUMN A. Write only the letter (A–O) next to the question number (1.3.1–1.3.10) in the ANSWER BOOK.

COLUMN A		COLUMN B	
1.3.1	Occurs when organisations plan for the future	A	request for proposal
1.3.2	Activities that include evaluating and comparing data	B	high-level project schedule
1.3.3	Design and implement large networks with specific expertise.	C	ad hoc development
1.3.4	An important component of a computer network	D	software license fees
1.3.5	This step involves documenting the requirements in a specific form	E	operating budget
1.3.6	A competitive strategy used by organisations	F	investment plans
1.3.7	Based on the company's future financial goals, time horizon, and priorities.	G	chief technology officer
1.3.8	A typical output for operational planning	H	strategic planning
1.3.9	A schedule that provides estimates in terms of resource requirements for a project	I	switch
1.3.10	An example of an ongoing cost	J	operating systems
		K	network specialist
		L	analysing
		M	differentiation
		N	higher salaries
		O	technology implementation plans

(10 × 1) (10)

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1.4 Write each of the following abbreviations in full:

1.4.1 MIS

1.4.2 JAD

1.4.3 RFC

1.4.4 DSS

1.4.5 BPR

1.4.6 SMS

1.4.7 DBMS

1.4.8 PERT

1.4.9 RFP

1.4.10 KMS

(10 × 1) (10)
[40]

TOTAL SECTION A: 40

NCCV

SECTION B

QUESTION 2

Read the following snippet and answer the questions.

WHY PROJECTS FAIL IN SOUTH AFRICA



Every company will in the course of its operations embark on a project. Whether the project is a strategic imperative or not, its chance of failing or being challenged is greater than that of it succeeding. Gartner's 2004 Third Quarter Research Report on application software development projects shows that 29% of all projects succeeded, 53% were challenged and 18% failed. In South Africa, 46% of all projects succeeded; 44% were challenged and 9% failed.

[Source: *www.itweb.co.za*]

2.1 Briefly describe FIVE different operational systems used by organisations. (5 × 2) (10)

2.2 There are several ways in which the systems development life cycle (SDLC) may be implemented in order to guide an information systems development project.

Name FIVE approaches, methodologies or implementations of the systems development life cycle (SDLC). (5)

2.3 List FIVE reasons that could lead system development projects to fail. (5)
[20]

QUESTION 3

3.1 List THREE advantages of an office automation system. (3)

3.2 Define the concept *data processing* in an organisation. (2)

3.3 Read the following snippet, accompanying screenshot and brief description and answer the questions that follow. Where applicable reference to the screenshot or snippet should be made in stating your answer.

To get the job done, systems analysts (SA) have to work with a large variety of people, on top of the IT professionals they always collaborate with. Systems analysts often work with programmers who write code to modify existing systems and/or build new ones. (*skilledup.com, 2017)*
The SA also specifies and shapes the system requirements and operations, the user interface and output and present the proposal to the client.

[Source: *http://www.skilledup.com/articles/what-do-computer-systems-analysts-do & https://www.prospects.ac.uk/job-profiles/systems-analyst*]

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The following two screenshots represent a user interface (UI) which is part of an information system (IS) that, determines the conservation fees that visitors to the various national pars must pay.

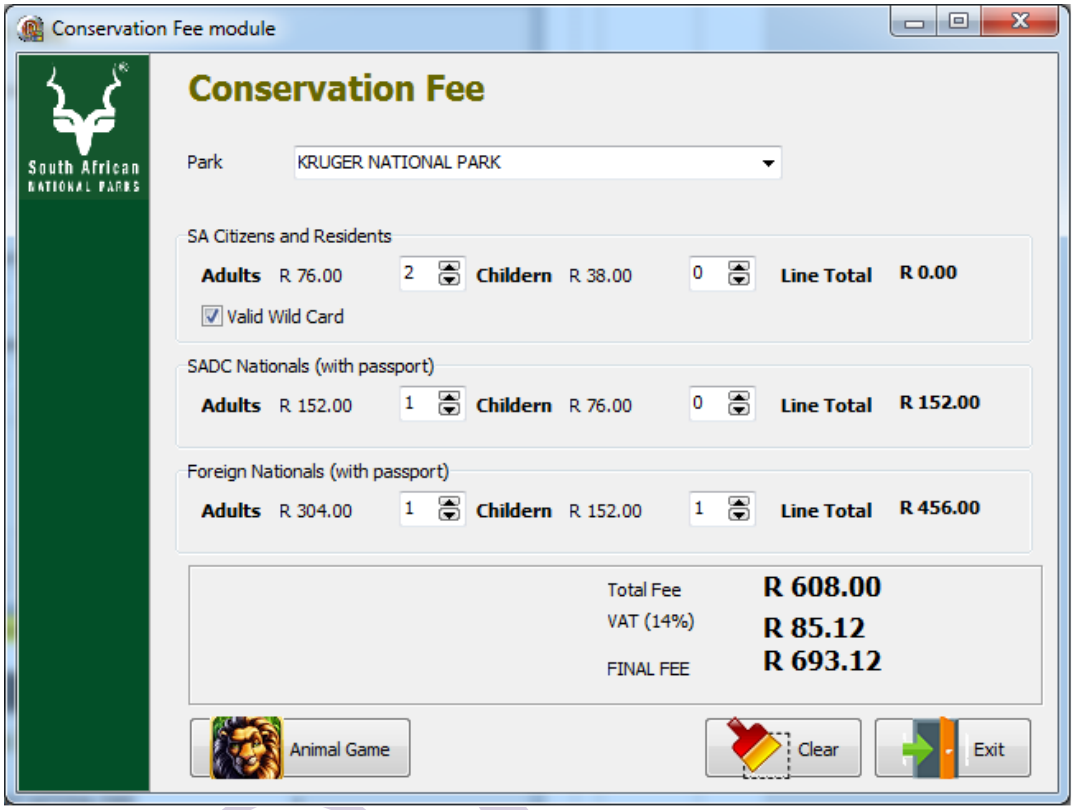


Figure 1 Screenshot of a UI with data relating to visitors to the Kruger National Park

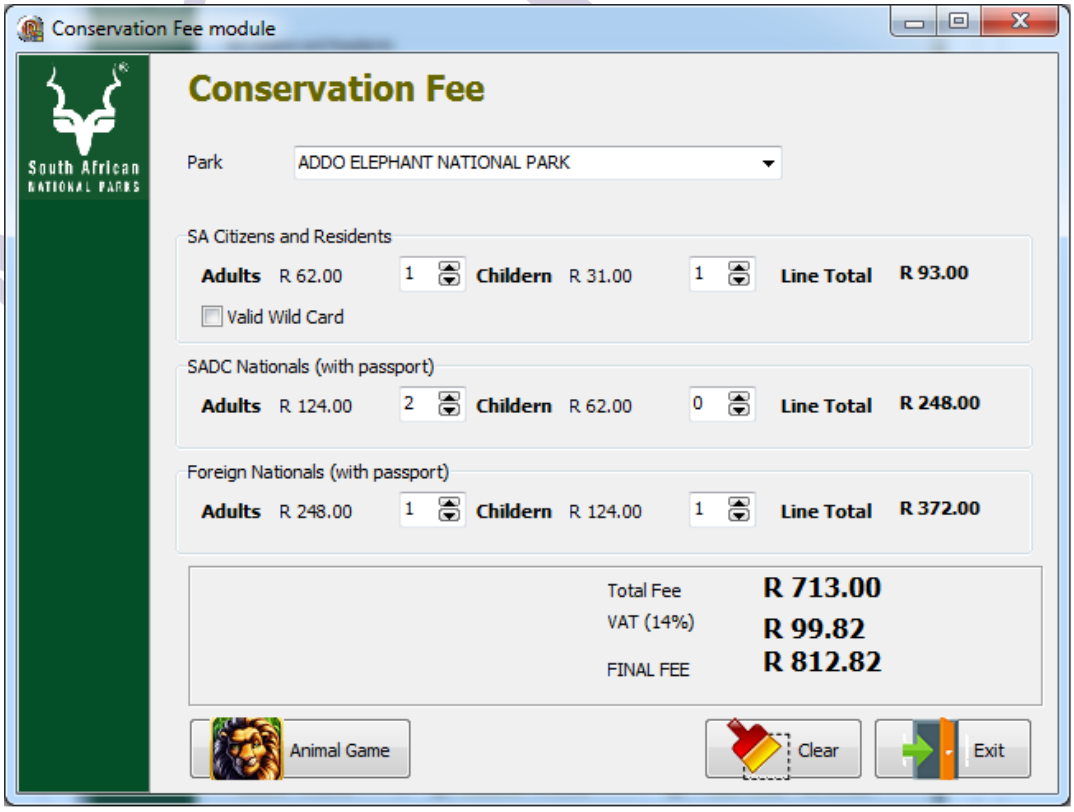


Figure 2 Screenshot of a UI with data relating to visitors to the Addo Elephant National Park

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3.3.1 Define the term: *Information System.* (2)

3.3.2 Various controls (components) such as buttons and frames are used as part of User Interface design.

Identify any other applicable input control (beside from a button) from the screenshot above. (1)

3.3.3 Identify any applicable output control (beside the form, groupbox or panel) used as part of the UI. (1)

3.3.4 Identify any TWO data processes in relation the screenshot presented. (2 × 1) (2)

3.3.5 A business rule is defined as: a statement that describes a business policy or procedure. Business rules are usually expressed at the atomic level -- that is, they cannot be broken down any further. [Source: http://whatis.techtarget.com]

Identity any possible business rule which is evident from the applicable screenshots (UI's). (2 × 1) (2)

3.4 The three basic operations in data processing involve the: input of data, the processing thereof and the creation of applicable output. IPO (Input, Processing, and Output) charts describe the input-process-output requirements of each module as part of an information system.

Discuss how the statements relate to the drawing of data flow diagrams. (2 + 4) (6)

[19]

QUESTION 4

Read the following snippet and answer the questions.

Organisations that consider information systems as playing a strategic role in their business have recognised that the information systems department needs to interact with the rest of the organisation.



4.1 There are various information systems professionals in an organisation.

Explain the roles of each of the following officers:

4.1.1 Chief information security officer (CISO) (2)

4.1.2 Database administrator (DBA) (2)

4.1.3 Systems administrator (2)

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4.2 Name THREE types of organisational charts or organograms that can be used to display the structure of an organisation. (3)

4.3 Name THREE main functions into which the role of operational management is normally split. (3)

4.4 List THREE factors that a person will have to consider when determining computer location requirements. (3)

4.5 Illustrate or draw a basic organisational diagram showing the information systems department and its sub departments. (5)

[20]

QUESTION 5

Read the following scenario and answer the questions.

The South African Tourism board has appointed you as the new IT Assistant Director to manage the Indaba 2018 media centre.

You have been tasked with the purchasing of 150 desktops for the five new IT laboratories that have recently been built. There was some deliberation between choosing desktops over laptops. Your other task is to recommend to the senior management of South African Tourism board various methods of acquiring and financing of the desktops. It is been decided by management not to purchase the desktops but rather to investigate alternate options.

SOUTH AFRICAN TOURISM

[Source: *www.tourismupdate.co.za*]

5.1 Motivate THREE possible reasons why desktop PC's instead of laptops could have been chosen for use in the IT laboratories. (3 × 2) (6)

5.2 Explain the importance of standardisation in terms of hardware or software during the acquisition of new computer technology. (3 × 1) (3)

5.3 There are THREE methods of hardware computer technology acquisition, namely renting, leasing and purchasing.

5.3.1 Name TWO possible reasons why management could have decided against the purchasing of the desktops. (2)

5.3.2 Motivate why you would favour the leasing option in contrast to the renting option. (2 + 2) (4)

5.4 Name TWO factors that need to be considered when a new work station is set up for the first time. (2)

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5.5 Explain why air-conditioning would be a requirement as part of the new laboratories. (2)

5.6 Explain why the installation of an uninterruptible power supply (UPS) and generators could also be of value and benefit for the laboratories and server room. (2)

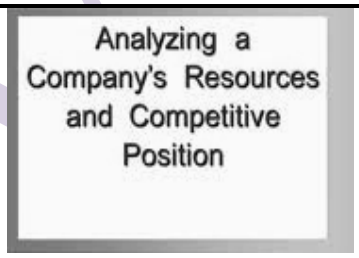
5.7 Differentiate between *information systems outsourcing* and *information systems offshoring*. (2)

[23]

QUESTION 6

Read the following snippet and answer the questions.

Positional analysis is a process of analysing how a company's current brand is perceived by the marketplace. When identifying target market opportunities, a company needs to compare the way its brand is perceived with the needs of the targeted market. Small businesses especially want to target markets that offer a good opportunity for success.



[Source: *www.smallbusiness.chron.com*]

6.1 Explain the concept: *system portfolio.* (2)

6.2 Draw a diagram that shows Michael Porter's five forces model. (5 + 2) (7)

6.3 Define the term: *cohesion.* (2)

6.4 Explain why the business needs of an organisation need to be defined. (3)

6.5 There are different frameworks and models that are used as part of the portfolio analysis during organisational planning. SWOT analysis is one of them and is done before strategic planning.

Discuss the concept: *SWOT analysis* (2 + (4 × 2)) (10)

6.6 Define the term *cash cow.* (2)

6.7 State FOUR guiding objectives of strategic information systems planning. (4)

6.8 List THREE activities of the tactical stage of information systems planning. (3)

[33]

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QUESTION 7

7.1 Define the term: *risk assessment*. (2)

7.2 Explain the purpose of conducting a feasibility study? (2)

7.3 List FIVE different approaches that can be used to gather data. (5)

7.4 Explain why it is important to define the purpose of a project. (2)

7.5 Describe the steps involved in the decision analysis phase in relation to the process of selecting a candidate solution. (5 × 2) (10)

7.6 Explain the importance of compiling a formal systems request. (3 × 1) (3)

7.7 Differentiate between *problem analysis* and *root cause analysis*. (4)

7.8 Define the term: *budget.* (1)

[29]

QUESTION 8

8.1 At the South African Tourism board indaba, visitors can book tickets for various events. Each event requires a different ticket. Events are hosed by exhibitors.

Draw a simple ERD of the scenario. Indicate only the applicable entities and relationships. You do not need to indicate the cardinality or relationship types. (7)

8.2 Study the following table presenting the total costs and total benefits of two possible systems (System A and System B) which the Tourism board possibly want to develop.

	System A	System B
Estimated total benefits of the system	R 121 000	R 130 000
Estimated total costs of operation	R 82 000	R 79 800

8.2.1 Define the concept ROI. (Do not write down the formula, explain what the acronym entails) (2)

8.2.2 Calculate the ROI for each system (5)

8.2.3 Which system A or B would you advise the tourism board to develop, and why? (2)

[16]

TOTAL SECTION B: 160
GRAND TOTAL: 200

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