



**higher education
& training**

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

MARKING GUIDELINE

NATIONAL CERTIFICATE (VOCATIONAL)

**SYSTEM ANALYSIS AND DESIGN
NQF LEVEL 4**

2 March 2020

This marking guideline consists of 9 pages.

SECTION A**QUESTION 1**

1.1	1.1.1	A		
	1.1.2	B		
	1.1.3	A		
	1.1.4	A		
	1.1.5	D		
	1.1.6	B		
	1.1.7	D		
	1.1.8	A		
	1.1.9	B		
	1.1.10	C		
			(10 × 1)	(10)
1.2	1.2.1	Functional		
	1.2.2	current system		
	1.2.3	Entities		
	1.2.4	Report		
	1.2.5	Process		
	1.2.6	Integrity		
	1.2.7	Probability		
	1.2.8	Traceability matrix		
	1.2.9	JAD		
	1.2.10	Scope creep		
			(10 × 1)	(10)
1.3	1.3.1	Computer-aided software engineering		
	1.3.2	Virtual reality		
	1.3.3	Uninterrupted power supply		
	1.3.4	SA Institute of Computer Scientists and Information Technologists		
	1.3.5	Work breakdown structure		
	1.3.6	Personal identification number		
	1.3.7	User requirement specification		
	1.3.8	Black economic empowerment		
	1.3.9	Data flow diagram		
	1.3.10	Augmented reality		
			(10 × 1)	(10)
1.4	1.4.1	E		
	1.4.2	S		
	1.4.3	K		
	1.4.4	F		
	1.4.5	D		
	1.4.6	B		
	1.4.7	C		
	1.4.8	J		
	1.4.9	L		
	1.4.10	I		
			(10 × 1)	(10)
				[40]

TOTAL SECTION A: 40

SECTION B**QUESTION 2**

- 2.1 Conduct and work of an individual from a particular profession. (2)
- 2.2 Moral principles that govern a person's behaviour. (2)
- 2.3
- Using the computers for tutorial-related activity.
 - Using the computers for accessing Internet and email.
 - Using the login provided by the college.
 - Using the computers in a safe and proper manner. (Any relevant 2 × 1) (2)
- 2.4
- Creating offensive, harassing, obscene and threatening messages.
 - Visiting websites that contain objectionable and offensive material (2)
- 2.5
- Stated in the policy as an unacceptable practice.
 - Against the law.
 - Cause harm to an individual or organisation. (3)
- 2.6 It specifies the limitations and practices that govern computer/network use. (2)
- 2.7
- Institute of Information Technology Professionals South Africa (IITPSA)
 - Information Technology Association of South Africa (ITA)
 - Information Technology Service Management Forum (itSMF)
 - IEEE South African Computer Society (Any relevant 1 × 1) (1)
- [14]**

QUESTION 3

- 3.1 3.1.1 Probability is the measure quantifying the likelihood that an event will occur.
- 3.1.2 A contingency plan is a way of reducing risk by reducing the consequence of the risk.
- 3.1.3 Biometrics refers to authentication techniques that rely on measurable physical characteristics that can be automatically checked.
- 3.1.4 Spyware is software that installs itself on a system and monitors what is done on a computer. (4 × 2) (8)
- 3.2 Risk = consequence × probability
 = R30 000 × 30%✓
 = R9 000✓ (2)

- 3.3
- Determine the acceptable level of risk for a project.
 - Assess all possible risks to determine actual risks.
 - If actual risk is greater than accepted risk, reduce individual risks. (3)
- 3.4
- 3.4.1 Process of converting easily readable information into unrecognised code. (2)
- 3.4.2 Encryption protects data or information from unauthorised access. (2)
- 3.4.3 Process of verifying the identity of a user or process. (2)
- 3.4.4
- Biometric authentication.
 - Two-factor authentication. (2)
- 3.4.5
- Security breaches: Unauthorised access of data, applications, services or networks by bypassing or hacking security measures.
 - Internal abuse of electronic communication: Internal employees can sabotage the data or systems storing sensitive and confidential government data.
 - Data and information damage: Data can be deleted or corrupted through malware such as a virus or a worm.
 - Technical faults: Failures such as software bugs or failure of computer components can occur.
 - Infrastructure failures: Loss of networking or hardware processing capabilities can occur thereby rendering the system non-operational.
 - Human error: Employees might forget to follow protocols and procedures with regard to system use.
- (Any 3 × 3)
- 1 Mark for the risk and 2 marks for the discussion (9)
- [30]**

QUESTION 4

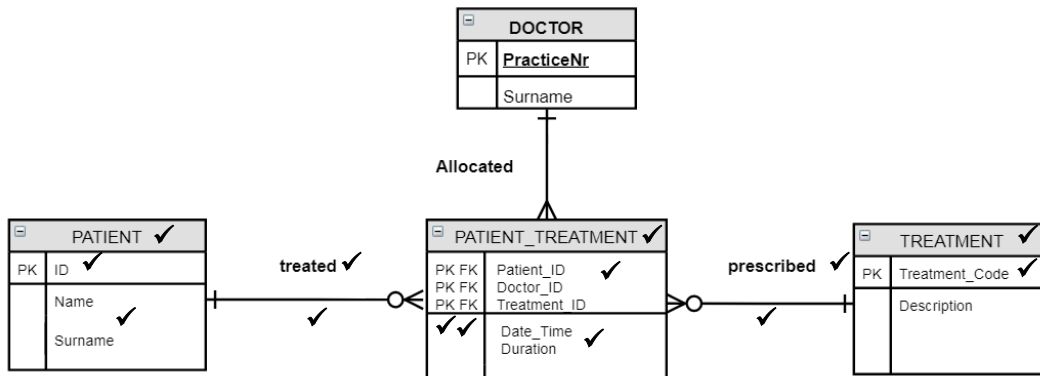
- 4.1
- 4.1.1 Questionnaire/Survey. (1)
- 4.1.2 It is a set of questions with a choice of answers used for gathering more information. (2)
- 4.1.3
- Interviews
 - Observations
 - Focus groups
 - Documentation reviews
 - Sampling (Any 3 × 1) (3)

4.1.4	Respondent.		(1)
4.1.5	Question 5: <i>When will you be staying with us again?</i>		(1)
4.1.6	It cannot be answered with a simple Yes/No or from multiple choices.		(2)
4.1.7	<ul style="list-style-type: none"> • Dichotomous questions (Yes/No) • Multiple-choice questions • Likert-scale questions 		(3)
4.1.8	<ul style="list-style-type: none"> • A dichotomous question is a question which can have two possible answers such as Yes/No, True/False, Agree/Disagree. • Multiple-choice questions are questions where the respondent is provided with two or more answer options of which one must be selected. • A Likert scale is an agreement scale used to measure how the respondent agrees with a given statement. (3 × 2) 		(6)
4.1.9	Question 6: <i>Do you think ...</i>		(1)
4.1.10	It causes the respondent to answer the question given the respondent's own bias.		(2)
4.1.11	<ul style="list-style-type: none"> • Speed of completion • Exploratory nature • Breadth and depth • Ease of preparation • Ease of analysis 	(Any 4 × 1)	(4)
4.2	Feeling of trust, confidence and understanding between two people		(2)
4.3	<ul style="list-style-type: none"> • Data-capture forms • System documentation • Business reports • Invoices • Receipts • Letters 	(Any 4 × 1)	(4)

[32]

QUESTION 5

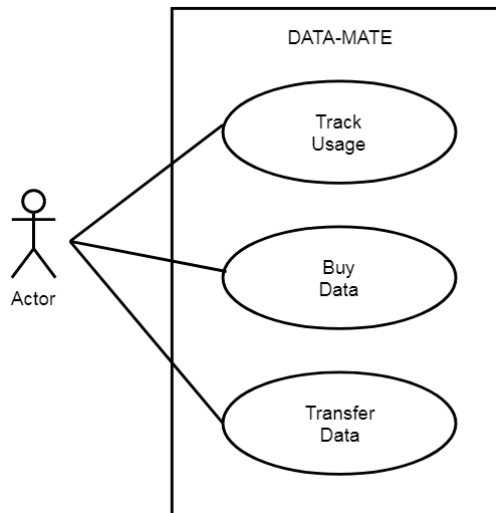
5.1 ER diagram



MARK ALLOCATION

1 mark per entity	2
1 mark for associative entity	1
1 mark per entity attributes	3
1 mark for correct relationships	2
2 marks for correct cardinality between entities	2
3 marks for indicating primary keys (all)	3
1 mark for indicating foreign keys	1
TOTAL possible marks 15	(14)

5.2 Use-case diagram



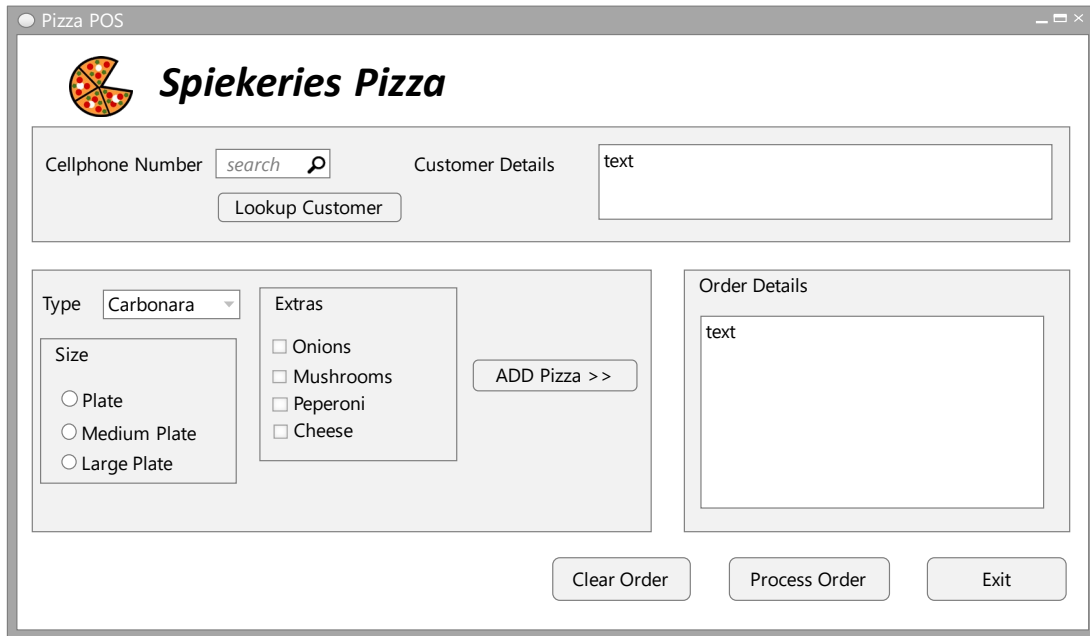
MARK ALLOCATION

1 mark for the system boundary	1
1 mark for actor	1
1 mark for each use case	3
1 mark for connecting lines (relationships)	1

(6)
[20]

QUESTION 6

6.1 Example of a UI



NOTE: This question is open to interpretation as it is a design.

MARK ALLOCATION

1 mark for drawing a form with icons and a title	1
1 mark for including a header	1
1 mark for component to lookup customer details	1
1 mark for an appropriate component to display customer details	1
1 mark for an appropriate component to make a pizza selection	1
1 mark for correct use of radio buttons (or dropdown to select size)	1
1 mark for correct use of checkboxes to select extras	1
1 mark for button or control that allows the user to include additional pizzas	1
1 mark to show the order details (or Amount due)	1
1 mark for showing Process order button	1
1 mark for showing Clear order button	1
1 mark for exit button	1

(12)

6.2 6.2.1 A prototype is a small system that looks and acts like the final system.

6.2.2 The purpose of a prototype is to allow others to see what the system will look like and to comment on how it works.

(2 × 2)

(4)

[16]

QUESTION 7

- 7.1
- Pilot adoption:
The system is only installed in pilot sites or locations where it is used and tested whereafter it is introduced to the rest of the sites.
 - Parallel adoption:
The new system is installed and run alongside the old system until everyone is comfortable with the new system after which the old system is removed.
 - Phased adoption:
Parts of the new system are gradually installed replacing the old module bit by bit until the entire old system is replaced.
 - Big bang adoption:
The old system is shut down and then users use the new system.
- (4 × 3) (12)
- 7.2
- 7.2.1 Preventive maintenance involves performing activities to prevent the occurrence of errors.
- Examples:
- Updating documentation
 - Code optimisation
 - Code restructuring
 - Updating drivers and other related software
- (1 + Any 1 example)
- 7.2.2 Change of the system functionality to meet the changing environment of the system
- Examples
- Changes to software
 - Changes to hardware
 - Changes to the operating system
- (1 + Any 1 example)
- (2 × 2) (4)
- 7.3 Perfective maintenance mainly deals with implementing new or changed user requirement and involves making functional enhancements to the system. (2)
- 7.4
- Throughput
 - Response time
 - Resource usage
 - System availability
- (4)
- 7.5 Black-box testing examines the system by using the input-output interface to check if it meets the requirements without examining its internal workings, whereas white-box testing examines the system by using the internal workings of the system to enable the tester to diagnose the system with more detail (2 + 2) (4)

7.6 Static testing

- It checks the design of a system by examining its source code and documentation.
- The system is tested without running it.
- Since static testing checks if the system meets the design specification, it is verification.

Dynamic testing

- It uses test data to check if the system produces correct output that is expected.
- The system is tested by running it.
- Dynamic testing checks if the user's needs and expectations are met under all possible conditions and therefore it is validation. (3 + 3)

(6)
[32]**QUESTION 8**

- 8.1 Artificial intelligence is the ability of a machine or computer to display a level of intelligence as if it was a human. (2)
- 8.2
- Robots can do repetitive tasks.
 - Robots can do dangerous tasks.
 - Robots can reach inaccessible areas. (3)
- 8.3
- 8.3.1 Artificial intelligence that enables computers to work out answers and make definite decisions by using data that is not exact, clear nor complete.
- 8.3.2 Artificial intelligence system that stores large amounts of data and uses it to answer questions on different scenarios and problems that humans may face. (2 × 2) (4)
- 8.4
- 8.4.1 Allows data to move in one direction only.
- 8.4.2 Able to process input data more than once and can change according to the input data it receives. (2 × 2) (4)
- 8.5 Virtual reality allows people to interact with an artificial environment created by a computer. (2)
- 8.6
- Microwave oven
 - Washing machine
 - Gas heater
 - Rice cooker (Any 1 × 1) (1)

[16]**TOTAL SECTION B: 160**
GRAND TOTAL: 200