higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

MARKING GUIDELINE

NATIONAL CERTIFICATE (VOCATIONAL)

SYSTEMS ANALYSIS AND DESIGN
NQF LEVEL 4

12 November 2024

This marking guideline consists of 11 pages.

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SECTION A

QUESTION 1

1.1	1.1.1	C✓		
	1.1.2	B✓		
	1.1.3	D✓		
	1.1.4	D✓		
	1.1.5	B✓		
	1.1.6	B✓		
	1.1.7	D✓		
	1.1.8	A✓		
	1.1.9	C✓		
	1.1.10	A✓	(10 × 1)	(10)
1.2	1.2.1	K✓		
	1.2.2	I✓		
	1.2.3	P✓		
	1.2.4	D✓		
	1.2.5	Q✓		
	1.2.6	H✓		
	1.2.7	J✓		
	1.2.8	F✓		
	1.2.9	B✓		
	1.2.10	O✓	(10 × 1)	(10)
1.3	1.3.1	False✓		
	1.3.2	False✓		
	1.3.3	True✓		
	1.3.4	True✓		
	1.3.5	True✓		
	1.3.6	True✓		
	1.3.7	False✓		
	1.3.8	False✓		
	1.3.9	False✓		
	1.3.10	True✓	(10 × 1)	(10)
1.4	1.4.1	Service Level Agreement✓		
	1.4.2	User Acceptance Testing✓		
	1.4.3	Extreme Programming✓		
	1.4.4	Software as a service✓		
	1.4.5	Optical Character Recognition✓		
	1.4.6	Class Responsibility Collaboration✓		
	1.4.7	Database Management System✓		
	1.4.8	Information Technology Association ✓ *of South Africa*		
	1.4.9	Object Oriented Programming✓		
	1.4.10	Decision Support System✓	(10 × 1)	(10)
				[40]

TOTAL SECTION A: 40

SECTION B

QUESTION 2

2.1 2.1.1 Intellectual property (IP) refers to the legal rights that protect creations of the mind, such as inventions, literary and artistic works, and various elements of software, including code, algorithms, interfaces, designs, and documentation. (2)

2.1.2 Software license infringement/Software piracy. (1)

2.1.3
- Sarah is installing the antivirus software on other computers without obtaining proper authorisation or licenses.
- Sarah is also engaging in Intellectual Property (IP) theft by illegally duplicating and distributing the software without permission.
- Sarah is deceiving new customers by not informing them about the installation or obtaining their consent, which is unethical.
- Sarah's actions can have severe legal repercussions for both her and the repair shop if they are caught.
- Any applicable and relevant answer. (Any 1 × 2) (2)

2.1.4
- Software developers lose money whenever you use pirated copies of software.
- Piracy will impact support and maintenance by the developers.

. (2 × 1) (2)

2.2 2.2.1 A cypher is a method or algorithm used for encrypting or decrypting information to secure its confidentiality during transmission or storage. (2)

2.2.2
- Protects credentials: Encrypted data like passwords becomes unreadable to attackers, even if intercepted.
- Verifies origin: Digital signatures with encryption confirm a message's sender and prevent tampering.
- Strengthens authentication: Secure credentials and verified messages make unauthorised access harder.
- Data integrity: Encryption helps ensure data hasn't been altered during transmission. (4 × 1) (4)

2.2.3 A - PP ✓ LE. ✓ (2)

[15]

QUESTION 3

3.1 3.1.1 The interviewee is a person with which an interview is conducted and who has knowledge about the current system or future needs. (2)

3.1.2 The entire group of individuals, objects, or events that possess the characteristics of interest in terms of collecting data. (2)

3.2 Planning / Analysis / Requirements gathering. (1)

3.3
- Questionnaires help to establish a clear direction for the project, guiding subsequent phases of the SDLC, such as system design, development, and implementation.
- Questionnaires are used to gather opinions, preferences, and requirements regarding a proposed or changes to a system.
- Questionnaires help to establish a clear understanding of stakeholders' needs, preferences, and requirements for the project.
- This information provides a solid foundation for defining the scope of the project, identifying key deliverables, and establishing project objectives.

(Any 1 × 2) (2)

3.4
- ***Wide Reach:*** Questionnaires allow researchers to reach a large and diverse audience efficiently. They can be distributed electronically or in print format, making it possible to collect data from a broad range of individuals regardless of their location or availability.
- ***Standardisation:*** Questionnaires provide a standard format for collecting data, ensuring consistency in the questions asked and the response options provided. This reduces the risk of bias in data collection and allows for easier comparison and analysis of responses across different respondents.
- ***Cost-Effectiveness:*** Compared to other data collection methods, questionnaires are often more cost-effective. Once designed, questionnaires can be distributed to multiple respondents at minimal cost, making them an efficient option for gathering data from a large sample size without significant financial investment.
- ***Anonymity and Confidentiality:*** Questionnaires offer respondents a level of anonymity and confidentiality. Respondents may feel more comfortable providing feedback or sharing their opinions when they know their identity is protected.
- ***Flexibility:*** Questionnaires can be tailored to collect both quantitative and qualitative data, allowing researchers to gather a wide range of information to meet their research objectives. Researchers can include closed-ended questions with predefined response options for quantitative analysis, as well as open-ended questions to capture detailed responses for qualitative analysis.
- ***Efficient Data Analysis:*** Once collected, questionnaire data can be easily quantified, tabulated, and analysed using statistical software or data analysis tools.

(Any 2 × 2) (4)

3.5
- Interviews
- Observation
- Document analysis
- Prototyping
- Workshops/Focus groups
- Brainstorming
- Site visits
- Job shadowing
- Benchmarking
- Data mining
- Joint Application Development (Any 4 × 1) (4)

3.6 3.6.1 A data dictionary is a centralized repository or document that provides detailed descriptions and metadata about the data elements, entities, attributes, and relationships used within an information system or database (2)

3.6.2 Sales/Order processing. (1)

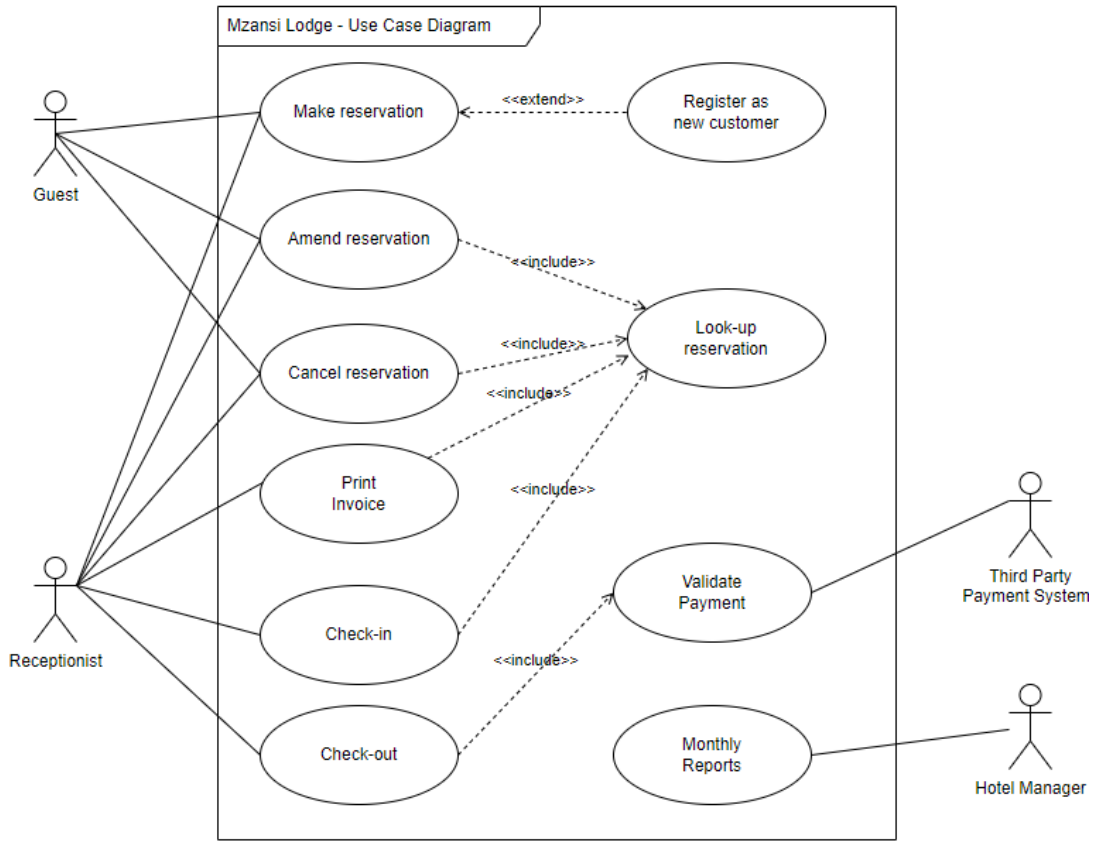
3.6.3 ***Entity***
Field
Customer✓
Customer Name✓
Product✓
Product Name/Description ✓
Unit Price
Invoice✓
Invoice Number✓
Invoice Date
Order✓
Order Number✓
Order Total (4 + 4) (8)
Note to markers – Field must be related to the entity

3.6.4
- Results list
- Purchase Order
- Receipt
- Payroll Record
- Bank Statement
- Expense Report
- Job Application Form
- Medical Record
- Tax Return
- Shipping Document (Any 2 × 1) (2)

[28]

QUESTION 4

4.1

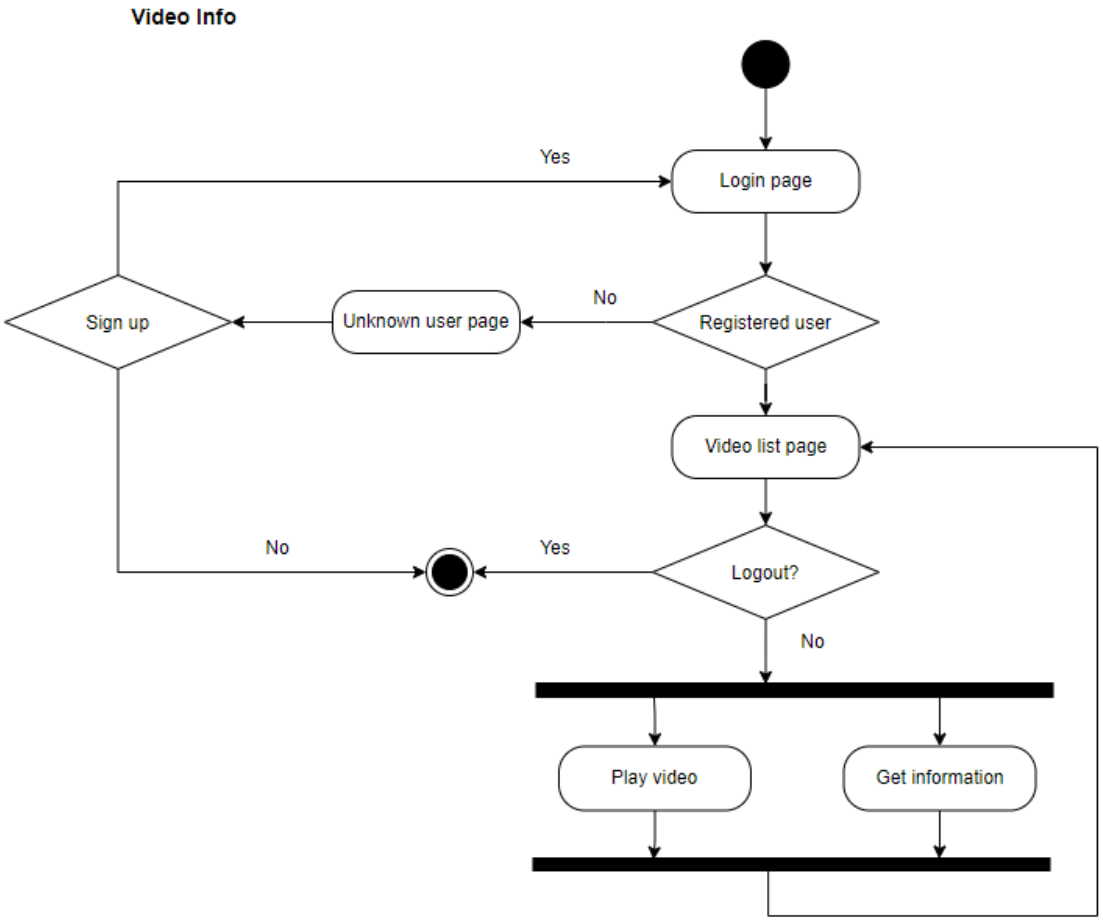


Mark allocation

1 mark per actor	4
1 mark for system boundary	1
1 mark per use case (Maximum of 6 marks)	6
1 mark for the correct associations between Guest actor and the applicable use cases 1 mark for the correct associations between Receptionist actor and the applicable use cases 1 mark for the correct associations between Third-party and the applicable use case 1 mark for the correct associations between Hotel manager actor and the applicable use case	4
4 marks for the correct use of the include dependency ÷ 2	2
1 mark for the correct use of the extend dependency	1

(19)

4.2



Mark allocation

1 mark for the initial node	1
1 mark per activity	5
1 mark per decision	3
1 mark for the join and fork node	1
3 marks for all logical control flow	4
1 mark for the final node	1

(15)

4.3 4.3.1 Super/Parent/Base. (1)

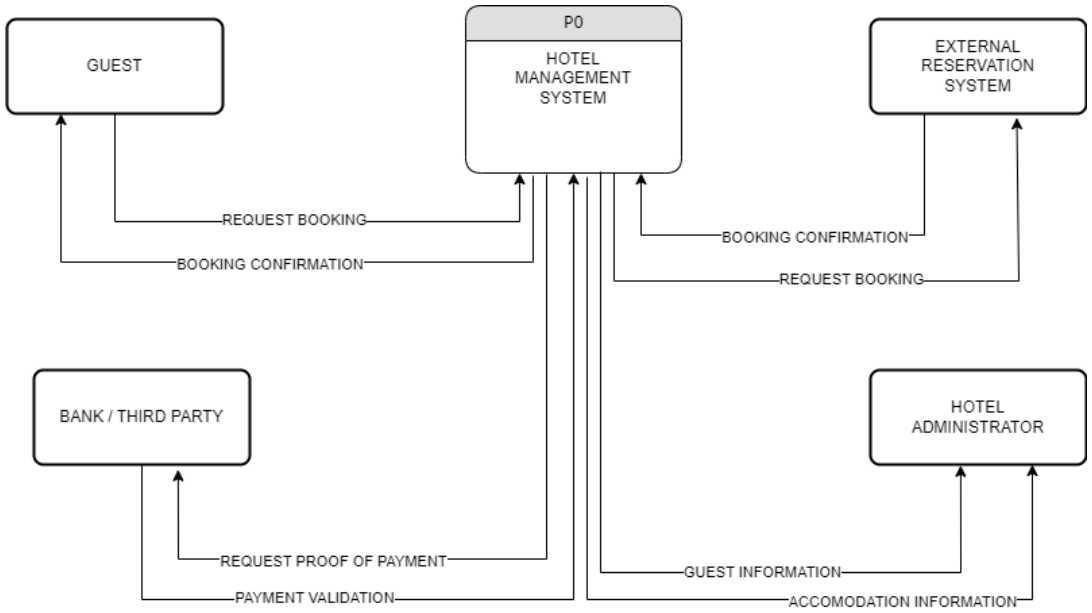
4.3.2 Sub/Child/Derived. (1)

4.3.3 Public access/modifier (1)

4.3.4 A class diagram visualises the static structure of a system using classes and their relationships, acting as a blueprint for code and communication among developers. (1 × 2) (2)

4.3.5 ***Attribute*** – Points / PreferredRoom.✓
Methods + registerPrivateGuest / addPoints / usePoints / setPreferredRoom / getPreferredRoom.✓ (2)

4.4

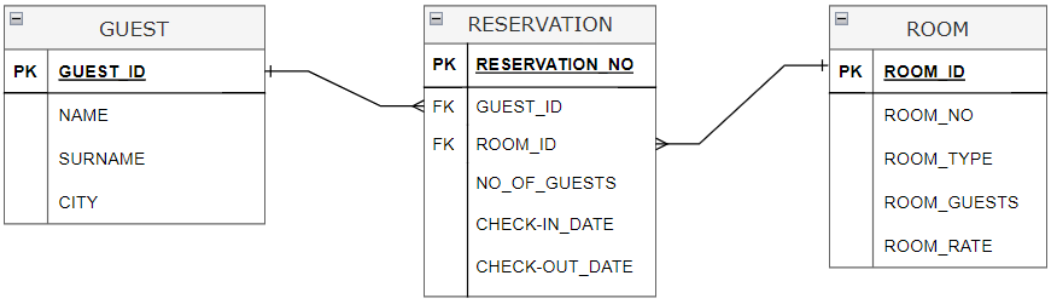


Mark allocation

1 mark for the Main Process P0	1
1 mark per Entity	4
1 mark per correct data flow	8

(13)

4.5



Mark allocation

1 mark per entity	3
1 mark per primary key	3
1 mark per foreign key	2
2 marks for all non-key attributes	2
1 mark for the correct relationship type	2

(12)
[66]

QUESTION 5

5.1 5.1.1 Aesthetics refers to the visual appearance and sensory qualities of a digital user interface using visual design principles to create a positive user experience.

5.1.2 Refers to the areas of a user interface design, also referred to as negative space, that are intentionally left empty or blank by any visual or textual elements. (2 × 2) (4)

5.2 A – File Menu
B – Status Bar
C – Tab Strip
D – Textbox
E – Radio button
F – Checkbox
G – Scroll bar
H – Button (8 × 1) (8)

5.3 User-interface (UI) design focuses on how users interact with an application or system, emphasising visual elements, navigation, and aesthetics to enhance usability and user experience. It aims to create intuitive, visually appealing interfaces that meet the needs of end users directly.

System-interface design deals with interactions between different software systems or between software and hardware. It involves designing APIs, protocols, and data formats to ensure efficient communication and integration. This type of design focuses on technical specifications, performance, and reliability, catering specifically to developers and system integrators.

(2 × 2) (4)

5.4
- Consistency
- Simplicity
- Clarity
- Hierarchy
- Feedback
- Accessibility
- Flexibility
- Familiarity
- Visual Appeal
- Performance (Any 5 × 1) (5)

5.5
5.5.1 Print
5.5.2 Save
5.5.3 Search
(3 × 1) (3)
[24]

QUESTION 6

6.1
- Improved Quality, preventing bugs.
- Increased Reliability.
- Cost Savings reducing development costs.
- Enhanced Security.
- Better User Experience.
- Compliance.
- Increased Customer Satisfaction.
- Faster Time-to-Market.
- Risk Mitigation.
- Continuous Improvement. (Any 3 × 1) (3)

6.2
6.2.1 Unit testing checks if software units or components are fulfilling functionalities in isolation or not.✓✓ (1 × 2) (2)

6.2.2 Integration testing checks the data flow from one module to other modules.✓✓ (1 × 2) (2)

6.2.3 System testing evaluates both functional and non-functional needs for the testing.✓✓

OR

The function of system testing is to evaluate the entire software system as a whole to ensure that it meets the specified requirements and functions correctly in its intended environment.✓✓
(1 × 2) (2)

6.3 Corrective maintenance entails correcting defects or errors found in the system during its operational use. ✓✓

Adaptive maintenance relates to modifying the system to accommodate changes in the environment, such as changes in user preferences, hardware configurations, or regulatory requirements. ✓✓ (2 × 2) (4)
[13]

QUESTION 7

7.1 Agile development is a project management methodology that values individuals and interactions over processes and tools.✓✓ (2)

7.2
- Scrum.
- Kanban.
- Extreme programming.
- Dynamic Systems Development Method.
- Crystal. (Any 4 × 1) (4)

7.3
- Increased flexibility. Agile allows teams to respond quickly to changes in requirements, priorities, and market conditions.
- Improved quality. Continuous integration and frequent iterations help identify and fix defects early, leading to higher-quality products.
- Improved communication. Agile encourages daily stand-ups, sprint reviews, and retrospectives, fostering better communication and collaboration among team members.
- Reduced risk. Frequent iterations and continuous feedback allow teams to identify potential risks early and address them before they escalate.
- Increased customer satisfaction. Regular feedback loops ensure that customer expectations are met and adjustments can be made promptly.
- Reduced development time. Agile's iterative approach means that functional increments of the product can be delivered more quickly, allowing for earlier deployment and user feedback.
- Continuous improvement. Agile promotes a culture of continuous improvement through regular retrospectives.

Any other relevant answers (4 × 2) (8)
[14]

TOTAL SECTION B: 160
GRAND TOTAL: 200

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