

Occupational Certificate: Software Engineer (NQF5) Database design and Information Systems (DDIS)	
Curriculum Code	251201001
SAQA Qualification ID	119458
Intake / year	2-2025
Assessment Name	Summative Assessment
Module NQF Level	6
Credits	15
Open date and time	31 October 2025 • Section A: 17:15 • Section B: 18:45
Close date and time	31 October 2025 • Section A: 18:45 • Section B: 20:15
Assessment Total Marks	Section A = 50 (20% of total mark percentage) Section B = 60 (30% of total mark percentage)
Pass percentage	65%

Lecturer Information	
Lecturer	Daniel van Deventer
Lecturer E-mail	danielvd@aie.ac

IMPORTANT NOTICE

Before submitting your assessment, please ensure that it is signed and that all your personal details are accurately filled in the designated space below (Section in red). Work will not be accepted unless the required sections below are fully completed prior to submission, resulting in a 0% grade for this assessment.

The signature must be your valid handwritten signature and NOT your name and surname typed in the space provided.

Student Number:	461476		
Student name and surname:	John Herbst	Date:	31/10/2025
Student cell phone number:	0604944665		
Student Signature:			
Lecturer name and surname:	Daniel van Deventer	Date:	
Lecturer Signature:			
Assessor name and surname:		Date:	
Assessor Signature:			
Moderator name and surname:		Date:	
Moderator Signature:			

Instructions to Candidates

1. Read each question carefully.
2. You must answer Section B below the space provided named "STUDENTANSWER". Once completed, the answer sheet, with your answers, must be converted to PDF and uploaded to the student portal. Make sure that all additional information is uploaded in a single Zipped folder.
3. QCTO students who achieve between 55-64% may have a further submission opportunity, subject to the departmental rules.
4. **NO LATE submissions will be accepted. (System will automatically close when due date and time is reached). If you encounter any difficulty with the student portal, immediately take a screenshot, log a ticket (attention support), and attach your assessment to the ticket.**
5. You must follow the departmental formatting guidelines.
6. You must write your name, surname, and student number on your script. A failure to do so will result in your script not being marked.
7. By submitting your answer sheet for marking, you declare the following:
 - a. You are familiar with the AIE's policies on academic dishonesty and plagiarism;
 - b. Your submitted is your own original work. Where you have made use of someone else's work, you have duly referenced such work making using of the APA style of referencing;
 - c. You have not allowed, and will not allow any other student to copy your work; and
 - d. You did not copy the work of another student.
8. Students that are dishonest will be subjected to disciplinary procedures.

Assessment Objective/s:

The Summative assessment (Section A and B) will cover the following assessment topics:

No	KM/KT number	KT Description
1.	KM03-KT0101	Introduction to Information Systems
2.	KM03-KT0102	Components of an Information System
3.	KM03-KT0103	Principles of Database Design

Scope:

The goal of this module is to provide you with a comprehensive understanding of information systems and the principles of database design. By exploring the structure, components, and operations of information systems, alongside the intricacies of designing efficient, reliable databases, you'll be equipped with the knowledge to develop and manage sophisticated information systems.

Technical Aspects:

Please verify that all pages are included when downloading this assessment by checking the page numbers at the bottom of the document.

Ensure the following font and size is used in this assessment

- a. Font: Arial
- b. Size: 12
- c. Font colour: Black

Save and upload the report as a .PDF (**No backgrounds**) with the following naming convention:

- a. Student no_StudentName_ StudentSurname_ModuleCode_SA1

Mark allocation for report

See Mark allocation sheet below

Question 1

(16)

<i>KM No</i>	<i>KT No</i>	<i>KT Description</i>
<i>03</i>	<i>0201</i>	<i>Hardware components</i>

a) Elaborate on the following terminologies:

- I. Operations support system [4]
- II. Transaction Processing System (TPS) [4]
- III. Process Control System [3]
- IV. Enterprise Collaboration System [2]
- V. Management Support System [3]

ANSWER

The Operational support system facilitate business transaction, control production, support internal as well as external Communication and updates the organization central database. Data is inputted by the end user witch this system then process to generate information products. It can also be further divided into a processing control system and enterprise collaboration systems.

We can then look at the TPS-Transaction processing system

This system is the system that processes all the transactions in an organization such as sales order, sales returns, credit sales credit slips and much more.

We can categorize these into three categories :Singal transaction processing, batch transaction processing and real time transaction processing.

The Process Control system uses critical information which is fed on a real time basis to make certain decisions in an organization without any manual input.

The management support system is a system that helps managers by providing precise information in a specific format to undertake an organizational decision. In simple words it helps the manager by providing information which the manager uses in to make his routinely decisions.

Question 2

(12)

<i>KM No</i>	<i>KT No</i>	<i>KT Description</i>
<i>03</i>	<i>0302</i>	<i>Fundamentals of database design phases (Database design models)</i>

a) Discuss the following terms:

- | | |
|---------------------|-----|
| I. Relational model | [2] |
| II. ER diagram | [2] |
| III. Normal form | [2] |
| IV. Data group | [2] |
| V. Primary key | [2] |
| VI. Foreign key | [2] |

ANSWER

The relational model shows how data is stored in a database in the form of a table.

ER Diagram uses a diagram to Describe the structure of a database. It uses three components: Entity, Relationship and attributes.

Normal Form is a Fase during the normalization process where certain rules have been applied to separate data into more logically related groups.

Data Group. When the rules of every normal form is applied we group the data in different groups.

Primary key: In each data group we have one primary key which will be the most suitable UID in the data group. It will be a unique piece of data in the group but the data in its group also relates to it. All the rest of the data will be connected to it.

Foreign key has the same value in as a primary key in a different group. It's responsible for connecting two groups.

Question 3

(9)

- a) Identify the nine (9) steps for drawing an Initial ER diagram from the raw data. [9]

ANSWER

Draw soft boxes and name the entity

Add the attributes to the different entities

Draw a crow's foot for each foreign key

Draw a mandatory relationship on the many- side and optional on the one side

Draw a bar on the relationship where the fk forms part of the pk

Place a # before each primary key instead of a pk

Indicate attribute optionality

Add in relationship optionality

Name all relationships

Question 4

(9)

- a) Identify the nine (9) steps for drawing an ER diagram from 3NF.

[9]

ANSWER

Draw soft boxes around the names of the entities

Draw crow's foot for each foreign key

Draw a mandatory relationship between the two linked entities

Take out the foreign key attributes

Draw a bar on the relationship where the Fk forms part of the Pk

Place a # in front of each PK

Indicate each attribute optionality

Relationship optionality is not required

Relationship naming is not required

Question 5

(10)

- a) Identify and discuss the three (3) Components of a relationship.

[10]

ANSWER

Name: It's a name given to each side of a relationship to explain how each side relates to the other side

Optionality: Must or may, Indicates if the relationship should always exist for each instance of the entity or not

Degree: How many of these relationships exists. If one side have an degree of 0, Then it is an optional relationship

Question 6

(4)

- a) Give four (4) examples of attributes.

[4]

ANSWER

Quantity, Age, Names, Colour

Mark allocation for student		
Question	Maximum Mark	Learner mark
Question 1.a	16	
Question 2.a	12	
Question 3.a	9	
Question 4.a	9	
Question 5.a	10	
Question 6.a	4	
Total:	60	

STUDENT ASSESSMENT FEEDBACK

Qualification Name:	Occupational Certificate: Software Engineer (NQF5)
Qualification SAQA Number:	119458
Subject Name:	Database design and Information Systems
Subject Code:	DDIS
Assessment Name:	Summative Assessment
Assessment Code:	DDIS_SA

Assessment Decision	Competent		Not yet competent	
----------------------------	------------------	--	--------------------------	--

Feedback report	1st Attempt		2nd Attempt	
	C	NYC	C	NYC
Unit standard Number(s)				
KM03				
KT0101				
KT0102				
KT0103				

General feedback to learner

Supply comprehensive feedback why learner is found NYC