

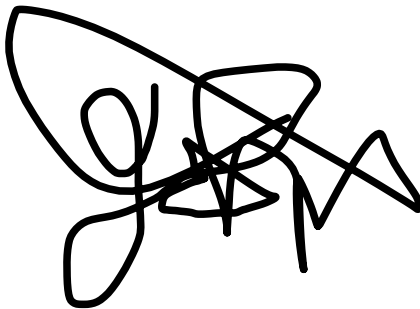
Occupational Certificate: Software Engineer (NQF5) Programming (PROG)	
Curriculum Code	251201001
SAQA Qualification ID	119458
Intake / year	2-2025
Assessment Name	Summative Assessment
Module NQF Level	6
Credits	20
Open date and time	03 October 2025 • Section A: 17:15 • Section B: 18:45
Close date and time	03 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:	4/27/2026
Student cell phone number:	0604944665		
Student Signature:			
Lecturer name and surname:	Daniel van Deventer	Date:	19/5/26
Lecturer Signature:	DvD		
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.	KM02-KT0101	Introduction to Programming
2.	KM02-KT0102	Data Structures & Algorithms
3.	KM02-KT0103	Logical Flow
4.	KM02-KT0104	Error Handling

Scope:

The primary objective of this module is to furnish you with a thorough understanding of the fundamental concepts underlying programming. From the basics of writing code to the complexities of data structures, algorithms, and logical flow, this module covers essential topics that form the foundation of all programming activities. Additionally, you will learn about error handling, a critical skill for developing reliable software applications.

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

(10)

<i>KM No</i>	<i>KT No</i>	<i>KT Description</i>
<i>02</i>	<i>0102</i>	<i>Operating Systems & Hardware Components (Platforms)</i>

- a) Identify and briefly discuss five (5) internal computer hardware components.

[10]

ANSWER

CPU – Central Processing unit Brain of computer

Ram- Where the computer does it work and runs programs

GPU– were all the GUI gets to run to save some ram for the computer

HDD – stores your data

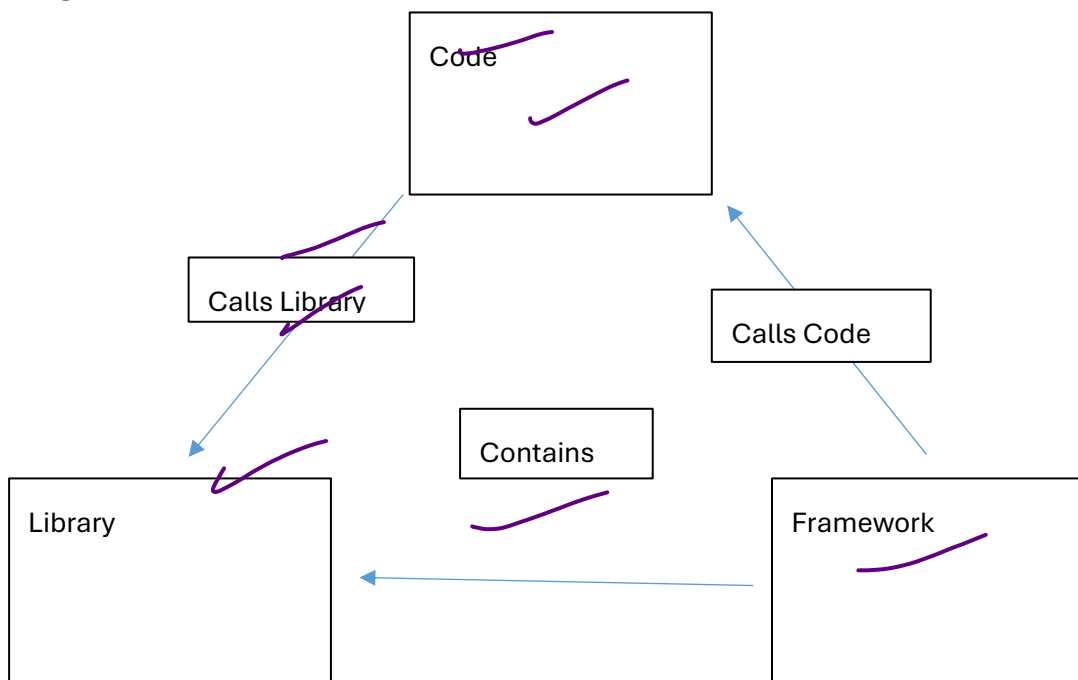
Monitor- Makes you able to see ,output of graphics

Question 2

(20)

<i>KM No</i>	<i>KT No</i>	<i>KT Description</i>
<i>02</i>	<i>0104</i>	<i>Libraries</i>

With the aid of a sketch, draw how [9]
developers use libraries.

ANSWER

In your own opinion, what is the [11]
difference between a library and a
framework?

ANSWER

A Framework is a System put together to solve a big problem.

A framework consists of a lot of tools that are configured to work together. A framework usually consist of a some other tools and libraries.

A Library is a specific tool to add to your code language to help solve a specific problem or speed up certain things. Some libraries work well when used with other libraries, That's why you need a Framework to know which libraries work well of other.

Question 3

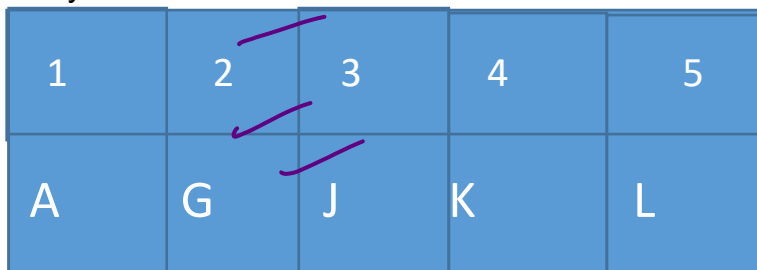
(18)

<i>KM No</i>	<i>KT No</i>	<i>KT Description</i>
<i>02</i>	<i>0201</i>	<i>Data Structures</i>

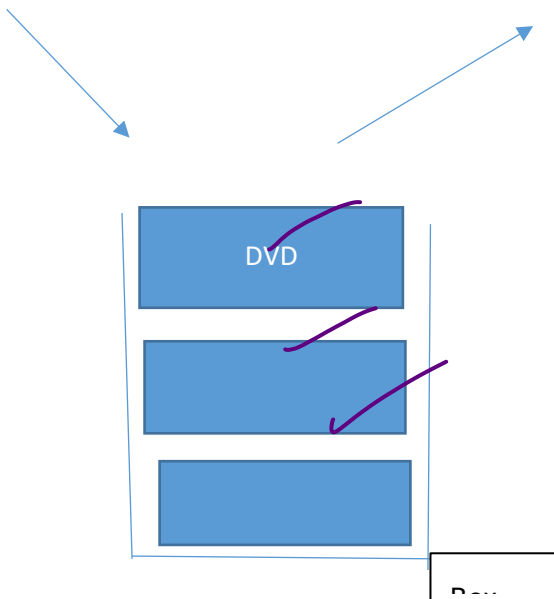
ε With the aid of a sketch, draw an example of the following data structures.

[18]

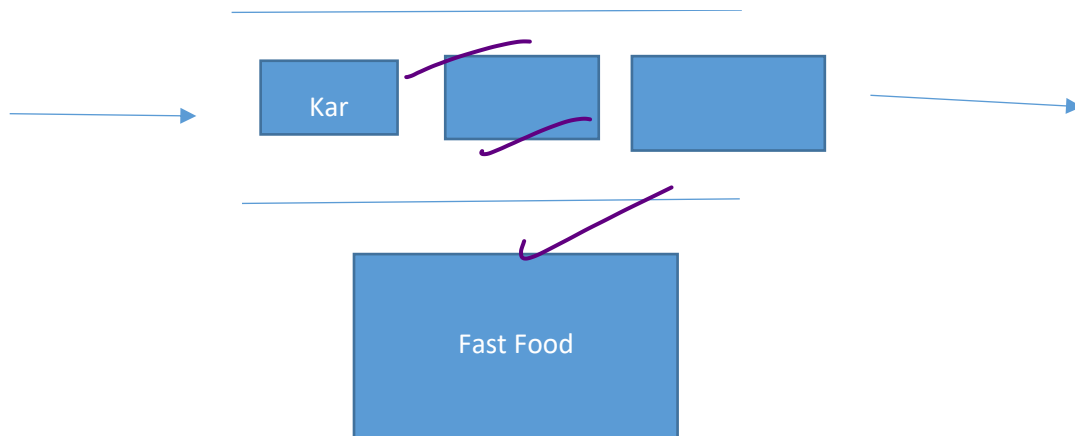
a. Array Data Structure



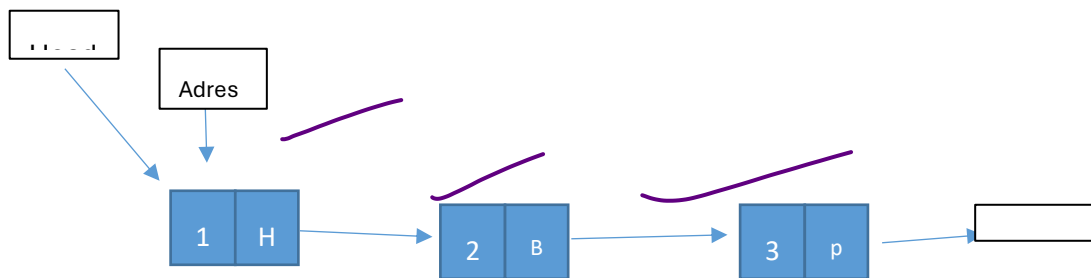
b. Stack Data Structure



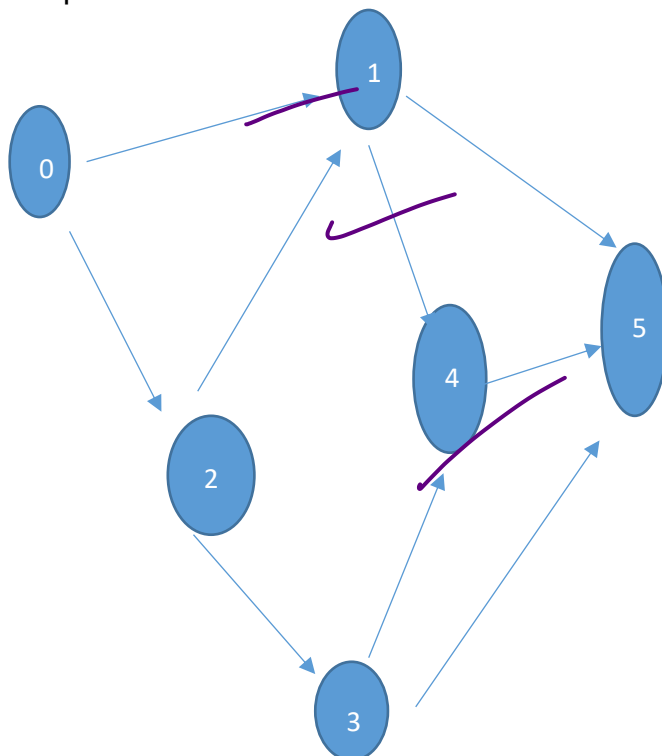
c. Queue Data Structure



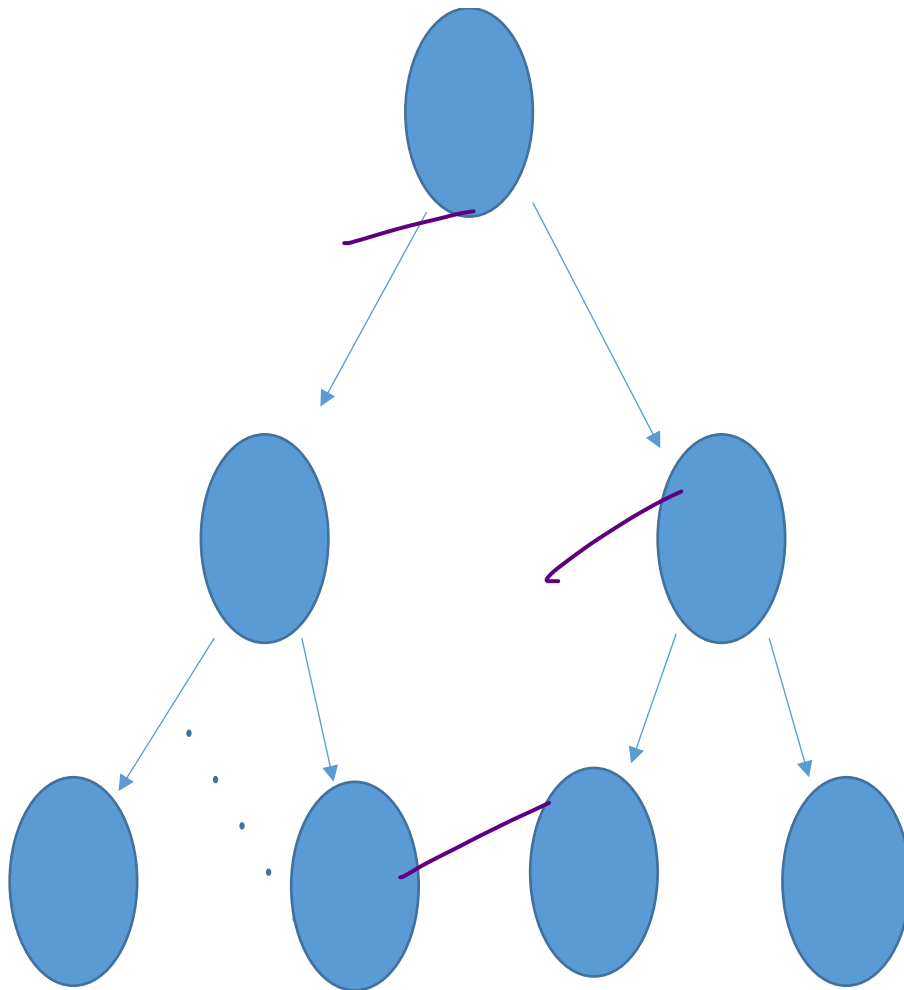
d. Linked List Data Structure



e. Graph Data Structure



f. Trees Data Structure



ANSWER

Question 4

(12)

<i>KM No</i>	<i>KT No</i>	<i>KT Description</i>
02	0202	Algorithms

a) Name and briefly discuss the characteristics of an algorithm.

[12]

ANSWER

Precision_ The steps have to be precisely and clear

Uniqueness- Each step should be unique and should depend on only the previous output. Or its input. It should give an output to the next step.

Finiteness-There should be an end to an algorithm otherwise nothing would be solved.

Input- The algorithm should have an Input

Output – The algorithm should have an output/solve the problem.

Generality- Algorithm should work on different inputs.

Mark allocation for student		
Question	Maximum Mark	Learner mark
Question 1.a	10	10
Question 2.a	9	9
Question 2.b	11	11
Question 3.a	18	18
Question 4.a	12	12
Total:	60	60

STUDENT ASSESSMENT FEEDBACK

Qualification Name:	Occupational Certificate: Software Engineer (NQF5)
Qualification SAQA Number:	119458
Subject Name:	Programming
Subject Code:	PROG
Assessment Name:	Summative Assessment
Assessment Code:	PROG_SA

Assessment Decision	Competent		Not yet competent	
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Feedback report	1st Attempt		2nd Attempt	
	C	NYC	C	NYC
Unit standard Number(s)				
KM02			C	
KT01				
KT02				
KT03				
KT04				

General feedback to learner Supply comprehensive feedback why learner is found NYC