Programming Fundamentals

Programming Fundamentals (PRFU)	
Assignment Number	1
Assignment Name	Formative Assessment
NQF Level	4
Credits	10
Due Date	

Marks	Total marks = 350
	Formative assessments through the semester contribute towards the student's module mark and are used to assess progress and identify areas for improvement. This formative assessment will contribute 25% towards final mark. Take note of the following with regards to late submissions:
	  a. One (1) day late (-5%)
	  b. Two (2) days late (-10%)
	  c. Three (3) days late (-15%)

Individual / Group Assignment	Individual
Lecturer Information	
Lecturer	
Lecturer E-mail	

Learning Objective:

Formative assessment 1 will cover the following concepts:

a. Number systems;

b. Logic gates and truth tables;

c. Converting boolean algebra;

d. Using boolean algebra;

e. The karnaugh map;

f. Decision tables; and

g. Program flowchart.

Attributes/Competencies Assessed:

The learner should demonstrate the following knowledge in this assessment:

a. Unit standard(s)

    a. 115359 - Demonstrate an understanding of the handling of error in a computer programming environment

    b. 115367 - Demonstrate logical problem solving and error detection techniques

c. 115392 - Apply principles of creating computer software by developing a complete programme to meet given business specifications

Scope:

The scope of this formative assessment is based on a solid knwoledge to identify errors and implement sound solutions with regards to the design of a software solution using various designing techniques.

Technical Aspects:

The number of pages for this formative assessment is _17_ and the following font and size should be used in your report:

a. Font: Arial

b. Size: 12 and 14 for headings

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_FA1 **(No ZIP folder uploads)**

Ensure adequate referencing is used when using information from either books or internet. Plagiarism is a serious offecne and can result in 0% for the assessment when excessive work is copied without proper referencing.

Please complete the following and sign as requested for Portfolio of Evidence (POE)

a. Pre-Assessment agreement (Save, sign and submit as PDF)

b. Assessment Feedback Agreement (Save, sign and submit as PDF)

Mark allocation for report

See Mark allocation sheet below

Question 1   (125)

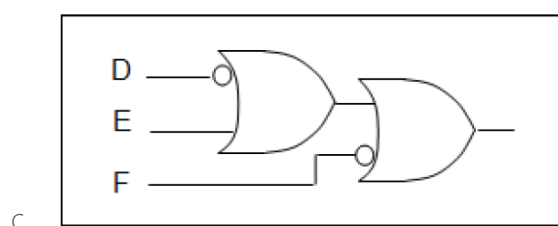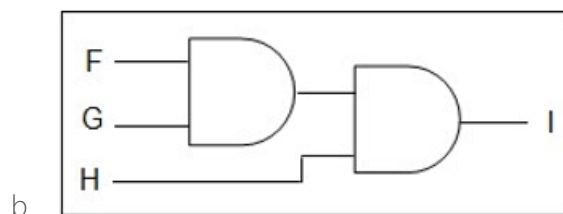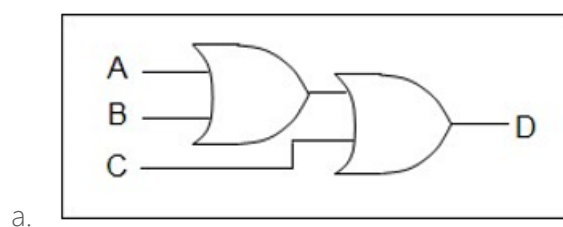| Unit standard	Specific outcome	Assessment criterion
	2	1
115367	2	2
	2	3
	4	1

    a.   Draw up the truth table for the exclusive NOR gate.   (35)

    b.   Prove the following using truth tables:

          a. $x + 0 = x$ (12)
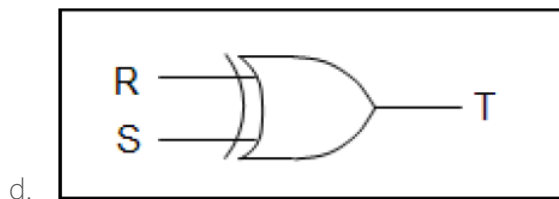
          b. $(x')' = x$ (15)

          c. $(x + y) + z = x + (y + z)$ (63)

Question 2   (14)

Unit standard	Specific outcome	Assessment criterion
115367	2	4

    a.   Write the Boolean equation for each of the following logic diagrams.   (14)

a.

b.

c.

d.

Question 3 (12)

Unit standard	Specific outcome	Assessment criterion
115367	3	1

Discuss the Boolean algebra grouping rules. (12)

Boolean algebra grouping	Symbol	Priority
Parentheses	( )	Writing an equation from a logical diagram comes first. When creating logical diagrams using equations, last thing to do
Brackets	[ ]	When creating logical diagrams from equations or writing equations from them, the second goal is to create a diagram.
Braces	{ }	When writing an equation from a logical diagram, priority three. When creating logical diagrams from equations, the first priority
Vinculum	_____	The Vinculum serves as a grouping symbol and, when appropriate, can be substituted for any of the others to represent NOT.

[i] I have referenced the table in the End note

Question 4 (16)

Unit standard	Specific outcome	Assessment criterion
115359	1	3
	2	1
	2	2

    a. Discuss your understanding of an overflow. (4)

    b. Discuss how an overflow is handled. (4)

    c. Using the octal addition table, add the following numbers: (8)

        a. 62 + 47

        b. 457 + 347

        c. 643 + 745

        d. 7254 + 4665

Question 5 (21)

Unit standard	Specific outcome	Assessment criterion
115359	1	3

Refer to logic gates in in course work.
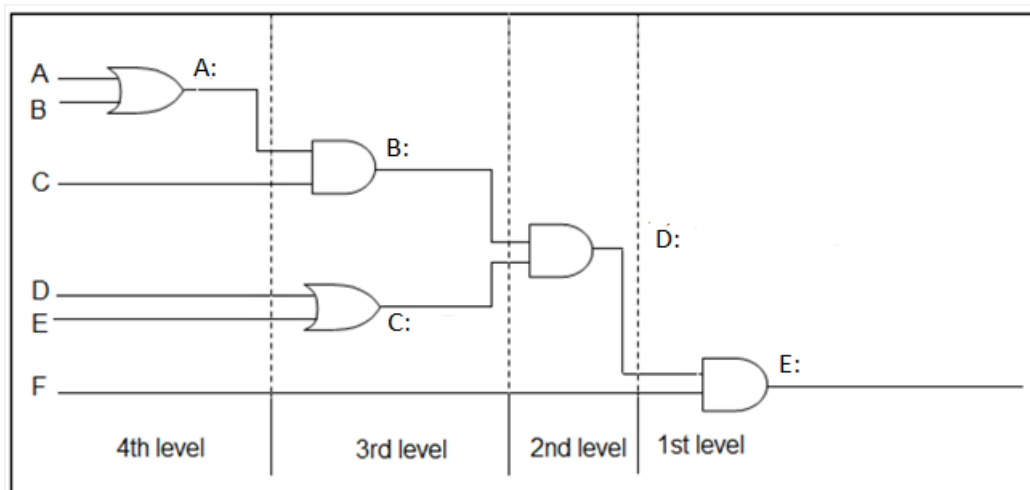
    a. Give the circuit equivalent symbol for the following function (21)

        a. $F = xy$

        b. $F = x + y$

        c. $F = x'$

        d. $F = x$

        e. $F = (xy)'$

        f. $F = xy' + x'y$

        g. $F = xy + x'y'$

Question 6 (16)

Unit standard	Specific outcome	Assessment criterion
115359	1	3

Complete the following fourth level logic diagram by filling the appropriate solution for "A, B, C, D, E":

Question 7 (64)

Unit standard	Specific outcome	Assessment criterion
115367	3	2
115359	2	3

Showing all the steps, reduce the following equations to their lowest form:

a. F = (ab)(cd')(a') (10)
b. F = xzy + xzy' + x'z (12)

c. F = ab'c + ac'(b + a') + a'b'c (12)
d. F = xwy' + z'yxw + wxyz + yx'zw (18)
e. F = AB'C + AB'C' + ABC' + ABC + A (12)

Question 8 (34)

Unit standard	Specific outcome	Assessment criterion
115367	3	3
	3	4

Simplify the following equations by using a Karnaugh map. Derive your binary and decimal minterms before plotting the map. Show all working:

a. F = ABC + AB'C + AB'C' (18)
b. F = A'B'C + A'BC + ABC' + ABC (16)

Question 9 (26)

Unit standard	Specific outcome	Assessment criterion
115392	2	3
115359	3	1
	3	2

Draw a decision table to illustrate each of the following. Remember to include the table title and size.

A lady goes to buy clothes, her options are:

a. A red dress
b. A cap
c. A shirt
d. A mini skirt

She cannot buy a shirt unless she buys a mini skirt as well. If she buys zero, one, or two items of clothing she gets one pair of shoes. If she buys three or four items of clothing she gets two pairs of shoes.

Question 10 (22)

Unit standard	Specific outcome	Assessment criterion
115392	2	3

Draw a program flowchart for the following problem. Use your own variable names.

To be accepted as a Flyaway airline employee, an applicant must be over 21 but less than 35 years of age, over 170cm tall, and weigh more than 60 kilograms. Otherwise, the applicant must be rejected. The required input values are name, age, height, and weight.

Processing continues until the name "ZZZ" is entered.

The factors are:

a. Name = "ZZZ"
b. Over 21 years of age

c. Less than 35 years of age

d. Height over 170 cm

e. Weight over 60 kilograms

The actions are:

a. Print name of acceptable applicant.

b. Reject applicant and read next record.

c. Stop processing when the name "ZZZ" is input.

As the name is used as an end-of-file condition, it is better and more efficient programming practice to first input the name, test it, then only if the end-of-file condition is NOT satisfied, input the rest of the data.

Mark allocation for student			
Section	Sub-section	Maximum Mark	Learner mark
Body of the report	Question 1.a	35	
	Question 1.b.a	12	
	Question 1.b.b	15	
	Question 1.b.c	63	
	Question 2.a	14	

	Question 3	12	
	Question 4.a	4	
	Question 4.b	4	
	Question 4.c	8	
	Question 5	21	
	Question 6	16	
	Question 7.a	10	
	Question 7.b	12	
	Question 7.c	12	
	Question 7.d	18	
	Question 7.d	18	
	Question 7.e	12	
	Question 8.a	18	
	Question 8.b	16	
	Question 9	26	
	Question 10	22	

Deductions	1 day late	-5	
	2 days late	-10	
	3 days late	-15	
Total:		350	

PRE-ASSESSMENT AGREEMENT

Assessment Preparation: Preparing the Candidate

Student name and surname	Nicolaas Labuschagne	Date	2023/04/14
		Time	12:36
Assessor name and surname		Venue	online

How to prepare the candidate	Document Requirements	Agree (tick)	Action Required
Explain to the candidate why you are meeting and the purpose of the assessment.	Assessment Policy Assessment process		
Discuss the assessment plan in detail.	Assessment strategy		

Explain assessment process, show assessment instruments to candidate and describe assessment conditions.	Assessment instruments		
Identify the role-players during assessment.	Assessors Moderator		
Describe the evidence required to be declared competent.	Examples of evidence		
Explain how evidence will be judged.	Mark allocation explained		
Explain to the candidate how to prepare: Give candidate assessment task description.	Assessment task description		
Confirm with the candidate what he/she should bring to the assessment.	Detailed briefing on exact requirements to be given to candidate in writing		
Ensure that candidate understands the procedures of all assessment practices.	Appeals Policy Appeals procedure Assessment Policy Assessment Procedure Moderation Policy Moderation procedure Verification Policy Verification Procedure		
Ask the candidate if he/she foresees any problems or identify any special needs.	List needs		

Agreed Assessment Plan	
Student name and surname:	Nicolaas Labuschagne
Assessor name and surname:	
Module name:	Programming Fundamentals
Unit Standard/s:	US115359 US115367 US115392
Type of Assessment i.e. Formative assignment, Formative test, Formative Practical, Summative etc.	Formative Assessment 1

Special Assessment Requirements:		N/A	
Event	Date, time and location	Resources required	Evidence to be generated
Assessments due date		Assessments	Completed documentation
Complete activity on MyAIE and upload to MyAIE			Completed Portfolio of Evidence
Submit Portfolio of Evidence			

Assessor Roles and Responsibility	
Roles	Assessor Guide Feedback Agent Reviewer
Responsibilities	Consult candidate re-assessment, assessment process and plan. Agree assessment process and plan with candidate. Forward documentation to candidate: plan, guide and assessment instruments. Assess candidate with the use of different instruments. Provide feedback on assessment findings. Support candidate through assessment process. Source feedback from candidate on assessment process. Review assessment process and outcome. Use assessment process as opportunity to transform assessment activities and outcomes.

Candidate Roles and Responsibility	
Roles	• Leaner • Feedback agent • Reviewer
Responsibilities	• Be available for assessment. • Be actively involved in the consultative process. • Learn from the assessment process. • Provide feedback to the assessor in terms of the assessment as learning activity.

	• Provide feedback to the assessor on the efficacy of the assessment process. • Review own role and assessor role in the assessment process.
Assessment Instruments	• Portfolio of Evidence • Questionnaire • Report • Presentation • Reflexive questions • Work sample • Practical's • Group Activity • Research activities

Assessment Process	
• Evaluation of POE addressing Essential Embedded Knowledge in unit standards. • Evaluation of Research Projects and other evidence addressing specific unit standards. • Consultation: assessment plan and assessment activities and instruments. Pre-assessment moderation and interviews conducted at this stage. • Observation: feedback on assessment against specific outcomes, critical outcomes in unit standards. • Feedback: to candidate regarding sufficiency of evidence and possible interview to gain supplementary evidence. • Feedback to candidate regarding assessment findings as well as review process.	

Feedback	Written feedback to be given to all stakeholders at the end of the assessment process, as well as verbal feedback to the candidate during assessment activities.
Recording Process	Process and findings to be recorded and submitted for record keeping purposes as well as moderation and verification.
Review Process	The review process is the responsibility of the assessor and the candidate. Joint reviewing will take place after feedback has been given to the candidate.
Right to appeal	The candidate must be advised of the right to appeal.
Resources Required	Assignments • POE • Assessments • Guides
I confirm that: • I have been consulted on and have agreed to the training and assessment process as detailed in the assessment guide.	

- I have been advised of my right to appeal against any assessment that is unfair, unreliable, invalid or impracticable.
- I have read and understood the appeal procedure.
- I know that assessments may be moderated or verified by an external party.
- The purpose of the assessment has been clearly explained to me.
- The criteria have been discussed with me, and I know I will be assessed against these criteria.
- I know when and where I will be assessed, and I was given fair notice.
- I know how the assessment will be done, and any other requirements related to the assessment.

Signed: Date: _____2023/04/14___

_____   _____

Overall Assessment Decision	Competent		Not yet competent	
Student's Signature			Date:	2023/04/14
Assessor's Signature			Date:	
Moderator's Signature			Date:	

ASSESSMENT FEEDBACK AGREEMENT

Assessment feedback: Feedback to learner

Qualification Name:	Full stack Web and software developer NQF 5
Qualification SAQA Number:	48872
Subject Name:	Programming Fundamentals

Subject Code:	PRFU
Assessment Name:	Formative Assessment 1
Assessment Code:	PRFU_FA1
Assessment Type:	Formative

Feedback report	1st Attempt		2nd Attempt	
	C	NYC	C	NYC
Unit standard Number(s)				
US115367				
SO2, AC1				
SO2, AC2				
SO2, AC3				
SO2, AC4				
SO3, AC1				
SO3, AC2				
SO3, AC3				
SO3, AC4				
SO4, AC1				
US115359				
SO1, AC3				
SO2, AC1				
SO2, AC2				

SO2, AC3				
SO3, AC1				
SO3, AC2				
US115392				
SO2, AC3				

General feedback to learner (Attempt 1)
Supply comprehensive feedback why learner is found NYC

Learner Number:	264146		
Learner name and surname:	Nicolaas Labuschagne	Date:	2023/04/14
Learner Signature:			
Lecturer name and surname:		Date:	
Lecturer Signature:			

Assessor name and surname:		Date:	
Assessor Signature:			
Moderator name and surname:		Date:	
Moderator Signature:			

Note to learner
Review the feedback provided by your lecturer to check that you have been found competent in this assessment. If there are any areas where you have been found not yet competent, you must redo those parts of the assessment and resubmit within the stipulated time frame. The section below will only be completed in cases where the learner was asked to resubmit parts of the assessment where they were found not yet competent.

General feedback to learner (Attempt 2)
Supply comprehensive feedback why learner is found NYC

Learner Number:	264146	
Learner name and surname:	Nicolaas Labuschagne	Date:	2023/04/14

Learner Signature:	
Lecturer name and surname:		Date:	
Lecturer Signature:	
Assessor name and surname:		Date:	
Assessor Signature:	
Moderator name and surname:		Date:	
Moderator Signature:	

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[i] Converting Boolean Algebra Unit 3 in the Unit 1 AIE Learner manual Table 3-25: Boolean algebra grouping symbols