higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

MARKING GUIDELINE

NATIONAL CERTIFICATE (VOCATIONAL)

PRINCIPLES OF COMPUTER PROGRAMMING

(First paper)

NQF LEVEL 3

18 November 2024

This marking guideline consists of 8 pages.

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SECTION A

QUESTION 1

1.1 C
1.2 C
1.3 A
1.4 A
1.5 B
1.6 D
1.7 C
1.8 D
1.9 A
1.10 D

(10 × 1) **[10]**

QUESTION 2

2.1 True
2.2 True
2.3 False
2.4 False
2.5 True

(5 × 1) **[5]**

QUESTION 3

3.1 E
3.2 C
3.3 D
3.4 H
3.5 J

(5 × 1) **[5]**

TOTAL SECTION A: 20

SECTION B

QUESTION 4

4.1

A	B	C	D	(A XOR B) AND (C OR D)
0	0	0	0	0
0	0	0	1	0
0	0	1	0	0
0	0	1	1	0
0	1	0	0	0
0	1	0	1	1
0	1	1	0	1
0	1	1	1	1
1	0	0	0	0
1	0	0	1	1
1	0	1	0	1
1	0	1	1	1
1	1	0	0	0
1	1	0	1	0
1	1	1	0	0
1	1	1	1	0
✓	✓	✓	✓	✓

NOTE: One mark per correct column (5)

4.2

(1 * 16^2) = 1 * 256 = 256 ✓
(10 * 16^1) = 10 * 16 = 160 ✓
(3 * 16^0) = 3 * 1 = 3 ✓

256 + 160 + 3 = 419 ✓ (4)

4.3



✓ (1)

[10]

QUESTION 5

5.1 IPO diagrams, flowcharts, and pseudocode are important tools in software development for planning, designing and communicating the structure and logic of a program.✓✓ (1 × 2) (2)

5.2

INPUT	PROCESS	OUTPUT
Student's mark	Determine the appropriate grade based on given criteria.	Letter grade (A+, A, A-, B+, B, C, D, or E)
✓✓	✓✓	✓✓

(6)

5.3

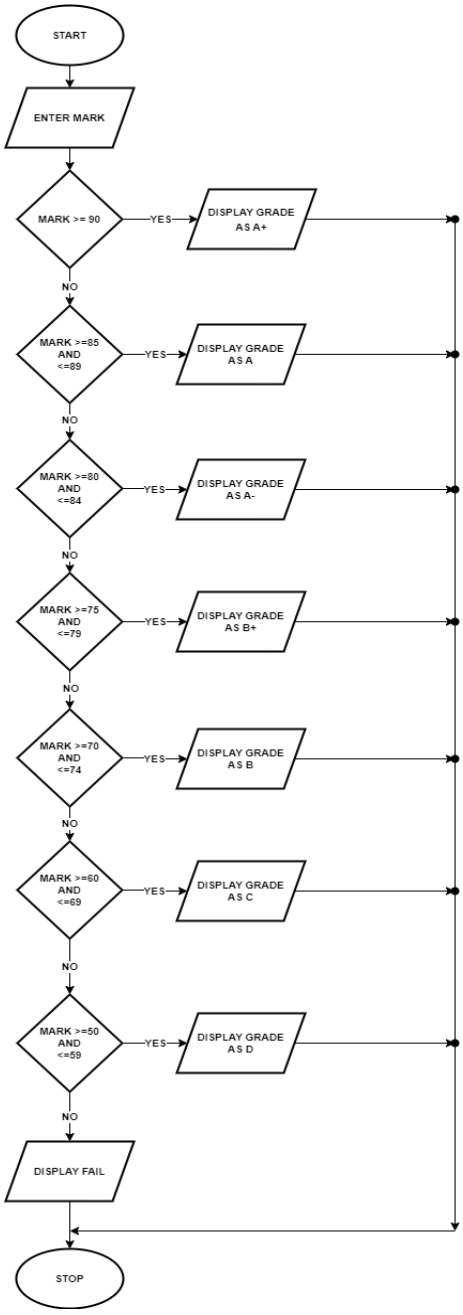
```
DetermineLetterGrade
~ This program will determine the letter grade of a test mark
~ Input: Provide a value for TestMark (a numeric value)

~ Processing (Check the test mark against grading criteria)

   If TestMark >= 80 Then
      LetterGrade = "A+"
   ElseIf TestMark >= 85 And <=89 Then
      LetterGrade = "A"
   ElseIf TestMark >= 80 And <= 84 Then
      LetterGrade = "A-"
   ElseIf TestMark >= 75 And <=79 Then
      LetterGrade = "B+"
   ElseIf TestMark >= 70 And <=74 Then
      LetterGrade = "B"
   ElseIf TestMark >= 60 And <=69 Then
      LetterGrade = "C"
   ElseIf TestMark >= 50 And <=59 Then
      LetterGrade = "D"
   Else
      LetterGrade = "E" ~ Below 50% – Fail
   End If

 ~ Output the determined letter grade
   display LetterGrade
End
```

Mark allocation

Pseudocode is complete.	
Pseudocode correctly covers input, processing, and output sections.	2 marks
Pseudocode is correct.	
Full marks (2) if the pseudocode correctly determines the grading.	2 marks
Use of pseudocode conventions	
Full marks (2) if pseudocode is either indented or makes use of comments (~).	2 marks

(6)

5.4



Mark allocation

Correct use of start/end symbols.	1 mark
Correct use of input symbol for students mark.	1 mark
Correct use of decision symbol to represent processing logic. (8 ÷ 2)	4 marks
Correct use of output symbol to indicate student letter grade.	1 mark
Correct use of output symbol to indicate fail.	1 mark

(8)
[22]

QUESTION 6

6.1 6.1.1 Five (5) (1)

6.1.2
- Array indices start at 0 for the first element.
- The maximum subscript value for an array is always one less than the number of elements in the array. (2 × 1) (2)

6.1.3 strArrNames✓ (4)✓ = "Thandeka"✓

Mark allocation

Correct array name	1 mark
Correct array index (4)	1 mark
Changed value	1 mark

(3)

6.1.4 ReDim.
Preserve. (2)

6.1.5
- The *Array.Sort* method in VB.NET is used to sort the elements of a one-dimensional array in ascending order.✓✓
- It modifies the original array to arrange its elements from smallest to largest based on the default comparison rules for the data type.✓✓ (2 × 2) (4)

6.2 6.2.1 Exception/Error handling. (1)

6.2.2
- Try-catch blocks in programming, including in VB.NET, are used for error handling and exception management.✓✓
- They allow one to handle and gracefully recover from unexpected or exceptional situations (exceptions) that may occur during the execution of code.✓✓
- Try-catch blocks help prevent a program from crashing due to unhandled exceptions, provide informative error messages to users, and allow one to take appropriate action when errors occur, such as logging the error, displaying a user-friendly message, or recovering from the error gracefully.

(Any 2 × 2) (4)

6.2.3 C – The code will compile without any errors. (1)

6.3 6.3.1 First pass

(a)	**34**	**25**	**12**	**22**	**11**	**64**	**90**

✓

Second pass

(b)	**25**	**12**	**22**	**11**	**34**	**64**	**90**

✓

Third pass

(c)	**12**	**22**	**11**	**25**	**34**	**64**	**90**

✓

Fourth pass

(d)	**12**	**11**	**22**	**25**	**34**	**64**	**90**

✓

Fifth pass

(e)	**11**	**12**	**22**	**25**	**34**	**64**	**90**

✓

(5 × 1) (5)

6.3.2
- Quick sort
- Merge sort
- Insertion sort
- Selection sort
- Heap sort
- Radix sort
- Shell sort
- Bucket sort
- Counting sort
- Cocktail shaker sort (or Bidirectional bubble sort) (Any 3 × 1) (3)

6.3.3
- Trace table
- Code review
- Code inspection (Any 1 × 1) (1)

NOTE: Watches, control breaks, step through, compiler debugging are automated debugging tools and are thus not *manual*.

[27]

QUESTION 7

7.1 7.1.1 H
7.1.2 G
7.1.3 C
7.1.4 D
7.1.5 F
7.1.6 E
7.1.7 B
7.1.8 A

(8 × 1) (8)

7.2 7.2.1
- Bridging entity
- Linking entity
- Associative entity
- Junction entity (Any 1 × 2) (2)

7.2.2
- It is used to establish a many-to-many relationship between two or more entities (tables) in a database.✓✓
- A bridging entity serves as an intermediary or connector between the related entities, allowing them to be associated with each other in a structured manner.✓✓ (2 × 2) (4)

7.2.3 A foreign key is a field or a set of fields in a database table that is used to establish a link between two tables in a relational database.✓✓ (1 × 2) (2)

7.2.4 ID#.
ClassID. (2)

7.2.5 SQL JOIN. (1)

7.2.6
- Database normalisation is a systematic process of organising data in a relational database to reduce data redundancy and improve data integrity.
- It involves breaking down large tables into smaller, related tables and establishing relationships between them.
- The main goal of normalisation is to reduce data anomalies and ensure that data are stored efficiently while maintaining its accuracy and consistency. (Any 2 × 1) (2)

[21]

TOTAL SECTION B: 80
GRAND TOTAL: 100

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