



# higher education & training

Department:  
Higher Education and Training  
**REPUBLIC OF SOUTH AFRICA**

## **MARKING GUIDELINE**

**NATIONAL CERTIFICATE**  
**DIGITAL ELECTRONICS N5**  
**24 November 2022**

**This marking guideline consists of 7 pages.**

**QUESTION 1**

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

(10 × 1) [10]

**QUESTION 2**

- 2.1  $6F,3_{16} = 01101111,0011_2$  ✓
- $34,2_8 = 11100,01_2$  ✓
- $16,75_{10} = 10000,11_2$  ✓

(3)

2.1.1

$$\begin{array}{r}
 11011110011 \\
 \times 1000011 \\
 \hline
 11011110011 \\
 11011110011 \\
 \hline
 11011110011 \\
 11011110011 \\
 \hline
 11101000110,011001
 \end{array}$$

Answer:  $11101000110,011001_2 = 746,64_{16}$  ✓ (4)

2.1.2

$$\begin{array}{r}
 1000011 \overline{) 1110001,1000} \\
 \underline{1000000} \phantom{1} \\
 1011100 \\
 \underline{1000000} \phantom{1} \\
 1100100 \\
 \underline{1000000} \phantom{1} \\
 1100100 \\
 \underline{1000000} \phantom{1} \\
 1000001
 \end{array}$$

Answer:  $1,101_2 = 1,625_{10}$  ✓ (5)

- 2.2  $34,7_8 = 11100,111_2$  ✓
- $17,5_8 = 1111,101_2$  ✓

$$\begin{array}{r}
 1011100,111 \\
 - 1001111,101 \\
 \hline
 1110000,011 \quad \checkmark \\
 1100011,001 \quad + \quad \checkmark \\
 \hline
 1010001,100 \quad \checkmark \\
 - 101100,100 \quad \checkmark \\
 \hline
 -101100,100
 \end{array}$$

Ignore Carry  $\frac{2}{C}$

Answer:  $-101100,100_2 = -2C,8_{16}$  ✓

(7)  
[19]

**QUESTION 3**

3.1  $F = \bar{B} + \bar{D} + \bar{A} \cdot \bar{C}$

Both the OR signs must be included for the answer to be marked. (3)

3.2

	$\bar{A}\bar{B}$	$\bar{A}B$	$AB$	$A\bar{B}$
$\bar{C}\bar{D}$		1	1	1
$\bar{C}D$	1	1	1	1
$CD$				
$C\bar{D}$	1			

✓✓ for posting correctly

✓✓ for grouping correctly

$F = \bar{A}\bar{B}C\bar{D} + \bar{C}D + B\bar{C} + A\bar{C}$  ✓✓✓✓

OR

	$\bar{C}\bar{D}$	$\bar{C}D$	$CD$	$C\bar{D}$
$\bar{A}\bar{B}$		1		1
$\bar{A}B$	1	1		
$AB$	1	1		
$A\bar{B}$	1	1		

✓✓ for posting correctly

✓✓ for grouping correctly

$F = \bar{A}\bar{B}C\bar{D} + \bar{C}D + B\bar{C} + A\bar{C}$  ✓✓✓✓

All three the OR signs must be included for the answer to be marked. (8)

3.3  $F(A,B,C) = \sum m(1;2;4;7)$

$F = \bar{A}\bar{B}C + \bar{A}B\bar{C} + A\bar{B}\bar{C} + ABC$  ✓

$F = \bar{A}(\bar{B}C + B\bar{C}) + A(\bar{B}\bar{C} + BC)$  ✓

$F = \bar{A}(B \oplus C) + A(\overline{B \oplus C})$  ✓

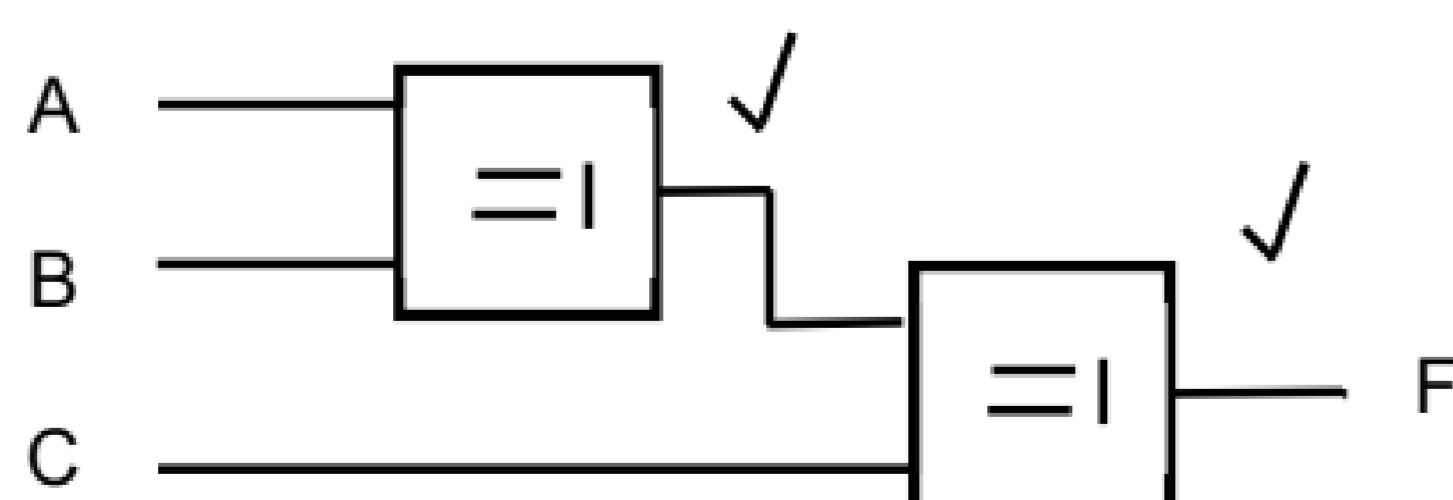
$F = A \oplus B \oplus C$  ✓

OR

<b>F</b>	$\bar{A}\bar{B}$	$\bar{A}B$	$AB$	$A\bar{B}$
$\bar{C}$		1		1
$C$	1		1	

✓✓ for posting correctly

$F = A \oplus B \oplus C$  ✓✓



OR