



higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NASIENRIGLYN

NASIONALE SERTIFIKAAT

LOGIKASTESELS N4

9 Desember 2025

Hierdie nasienriglyn bestaan uit 9 bladsye.

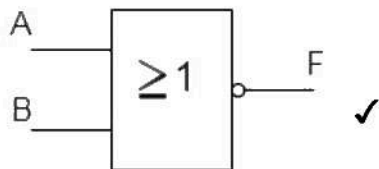
VRAAG 1

1.1 0,125 (1)

1.2 Logika 0 – 0 V ✓
Logika 1 – 5 V ✓ (2)

1.3 $F = \overline{A+B}$ ✓

A	B	F
0	0	1
0	1	0
1	0	0
1	1	0



1.4 11000101010 ✓✓ (1 × 2) (2)

- 1.5
- Dit is maklik om te implementeer en te gebruik.
 - Dit word gebruik om foute op te spoor en reg te stel.

Alternatiewe antwoorde:

- Binêre kodes word gebruik om data oor te dra.
- Binêre kodes word gebruik om data te stoor.

(Enige 2 × 1) (2)

1.6 1.6.1 1
1.6.2 AB
1.6.3 $B + A\bar{C}$
1.6.4 AB

(4 × 1) (4)

1.7 1.7.1

AB \ CD	00	01	11	10
00	1	0	0	1
01	1	0	0	1
11	1	1	0	1
10	1	0	0	1

$F = \bar{B} + CD$ ✓

1.7.2

AB \ CD	00	01	11	10
00	1	∅	1	∅
01	1	1	1	1
11	∅	1	∅	∅
10	1	1	1	1

$$F = 1 \checkmark$$

1.7.3

AB \ CD	00	01	11	10
00	0	0	0	0
01	1	0	1	0
11	0	0	0	0
10	1	0	0	1

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

(3 × 2) (6)
[20]

VRAAG 2

2.1 2.1.1 $32,7_8 = 011010,111_2$
 $64,5_{10} = 1000000,1_2$

0	0	1	1	0	1	0,	1	1	1	✓	
1	0	0	0	0	0	0,	1	0	0	✓	
0	1	1	1	1	1	1,	0	1	1	✓	
0	0	1	1	0	1	0,	1	1	1		
1	0	1	1	0	1	0,	0	1	0	✓	
-	0	1	0	0	1	0	1,	1	0	1	✓

$$= -25, A_{16} \checkmark$$

2.1.2

$$CA, 6_{16} = 11001010,011_2$$

$$12,25_{10} = 1100,01_2$$

[illegible]

2.1.3

$$168, C_{16} = 000101101000,1100_2$$

$$31,5_8 = 011001,101_2$$

$$\begin{array}{r}
 11001101 \quad \begin{array}{cccccccccccc} & & & & & & 1 & 1 & 1 & 0 & 0, & 0 & 0 & 0 & 1 & \checkmark \\ \hline 1 & 0 & 1 & 1 & 0 & 1 & 0 & 0 & 0 & 1 & 1 & 0, & 0 & 0 & 0 & 0 & \checkmark \\ - & 1 & 1 & 0 & 0 & 1 & 1 & 0 & 1 & & & & & & & & \\ \hline & 1 & 0 & 0 & 1 & 1 & 0 & 1 & 1 & 1 & & & & & & & \checkmark \\ & & 1 & 1 & 0 & 0 & 1 & 1 & 0 & 1 & & & & & & & \\ \hline & & & 1 & 1 & 0 & 1 & 0 & 1 & 0 & 1 & & & & & & \checkmark \\ & & & - & 1 & 1 & 0 & 0 & 1 & 1 & 0 & 1 & & & & & \\ \hline & & & & & & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \checkmark \\ & & & & & & - & & & 1 & 1 & 0 & 0 & 1 & 1 & 0 & 1 \\ \hline & & & & & & & & & & & & & & & & \end{array} \\
 \\
 = 34,04_8 \checkmark
 \end{array}$$

$$(3 \times 6) \quad (18)$$

2.2 American Standard Code for Information Interchange.✓✓

$$(1 \times 2) \quad (2)$$

2.3 \$ - 010 0100✓

6 - 011 0110✓

Q - 101 0001✓

y = 111 1000 ✓

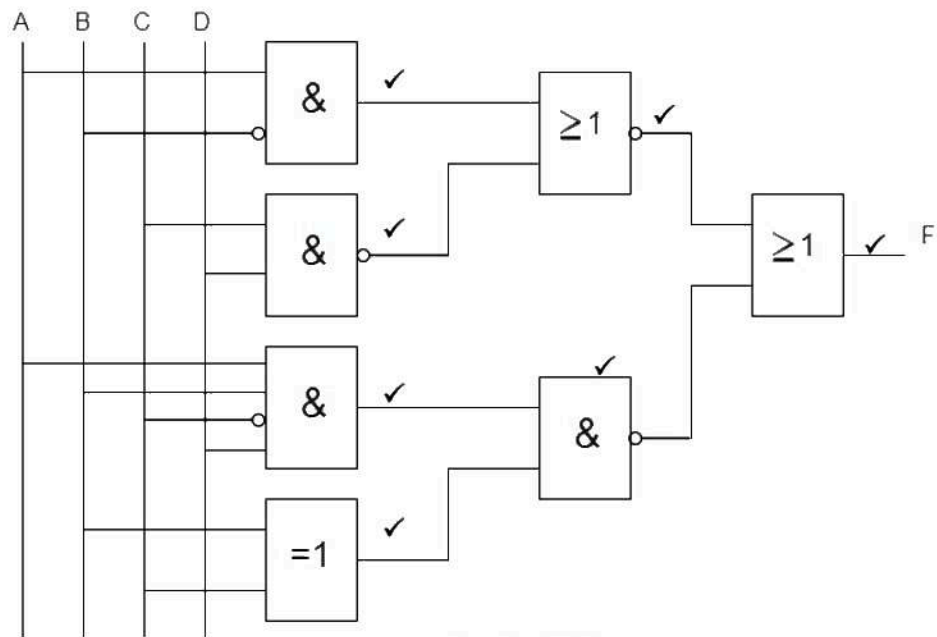
$$\sim -101\ 1001\checkmark$$

(5)

[25]

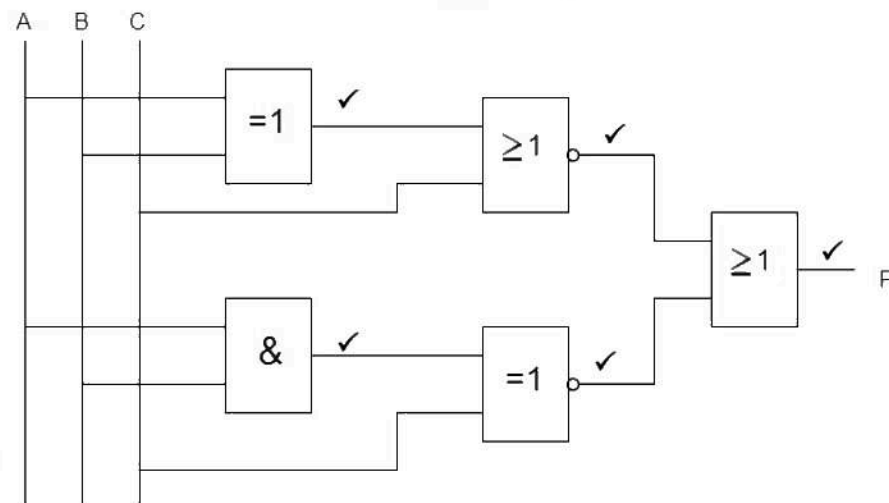
VRAAG 3

3.1 3.1.1



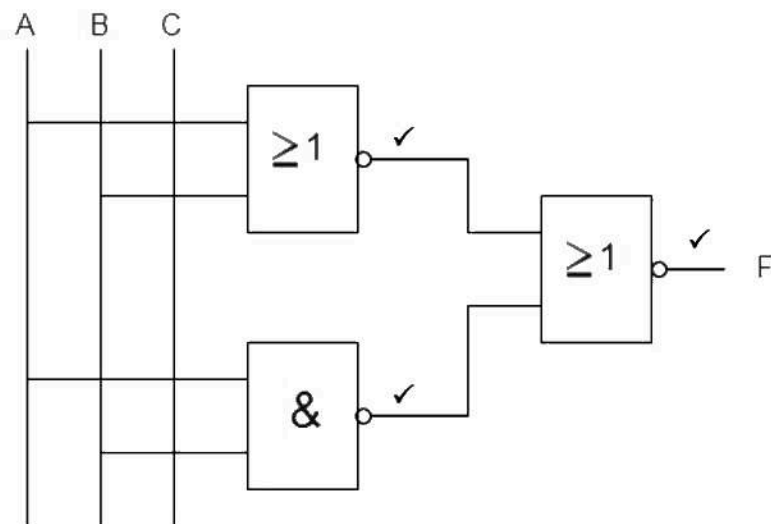
(7)

3.1.2



(5)

3.1.3



$$\begin{aligned}
 3.2 \quad 3.2.1 \quad F &= \bar{A}BC + A\bar{B}\bar{C} + \bar{A}\bar{B}\bar{C} + A\bar{B}C + ABC \\
 &= \bar{A}BC + \bar{B}\bar{C}(A + \bar{A}) + AC(\bar{B} + B) \quad \checkmark \\
 &= \bar{A}BC + \bar{B}\bar{C} + AC \quad \checkmark \\
 &= C(A + \bar{A}B) + \bar{B}\bar{C} \quad \checkmark \\
 &= C(A + B) + \bar{B}\bar{C} \\
 &= AC + (BC + \bar{B}\bar{C}) \quad \checkmark \\
 &= AC + B \oplus C \quad \checkmark
 \end{aligned} \tag{4}$$

$$\begin{aligned}
 3.2.2 \quad F &= \overline{\overline{A + B} + A + \bar{B}} \\
 &= \overline{\overline{A + B}} \cdot \overline{A + \bar{B}} \\
 &= (\bar{A} + \bar{B})(A + \bar{B}) \quad \checkmark \\
 &= 0 + \bar{A}\bar{B} + A\bar{B} + \bar{B} \quad \checkmark \\
 &= \bar{A}\bar{B} + \bar{B} \quad \checkmark \\
 &= \bar{B}(\bar{A} + 1) \\
 &= \bar{B} \quad \checkmark
 \end{aligned} \tag{3}$$

$$\begin{aligned}
 3.2.3 \quad F &= \overline{\overline{A\bar{B}\bar{C}} + A\bar{B}\bar{C} + \bar{A}\bar{B}\bar{C} + \bar{A}\bar{B}C} + B \\
 &= A\bar{B}\bar{C} + A\bar{B}C + \bar{A}\bar{B}\bar{C} + \bar{A}\bar{B}C + B \\
 &= A\bar{B} + \bar{A}\bar{B} + B \quad \checkmark \\
 &= \bar{B}(A + \bar{A}) + B \quad \checkmark \\
 &= \bar{B} + B \\
 &= 1 \quad \checkmark
 \end{aligned} \tag{3}$$

[25]

VRAAG 4

Toevoer (8421)				Afvoer (XS-3)			
A	B	C	D	W	X	Y	Z
0	0	0	0	0	0	1	1
0	0	0	1	0	1	0	0
0	0	1	0	0	1	0	1
0	0	1	1	0	1	1	0
0	1	0	0	0	1	1	1
0	1	0	1	1	0	0	0
0	1	1	0	1	0	0	1
0	1	1	1	1	0	1	0
1	0	0	0	1	0	1	1
1	0	0	1	1	1	0	0
1	0	1	0	∅	∅	∅	∅
1	0	1	1	∅	∅	∅	∅
1	1	0	0	∅	∅	∅	∅
1	1	0	1	∅	∅	∅	∅
1	1	1	0	∅	∅	∅	∅
1	1	1	1	∅	∅	∅	∅
✓ ^{1/2}	✓ ^{1/2}	✓ ^{1/2}	✓ ^{1/2}	✓ ^{1/2}	✓ ^{1/2}	✓ ^{1/2}	✓ ^{1/2}

CD \ AB				
	00	01	11	10
00			∅	1
01		1	∅	1
11		1	∅	∅
10		1	∅	∅

✓

$$W = A + BD + BC \quad \checkmark$$

CD \ AB				
	00	01	11	10
00		1	∅	
01	1		∅	1
11	1		∅	∅
10	1		∅	∅

✓

$$X = B\bar{C}\bar{D} + \bar{B}D + \bar{B}C \quad \checkmark$$

CD \ AB	00	01	11	10
00	1	1	∅	1
01			∅	
11	1	1	∅	∅
10			∅	∅

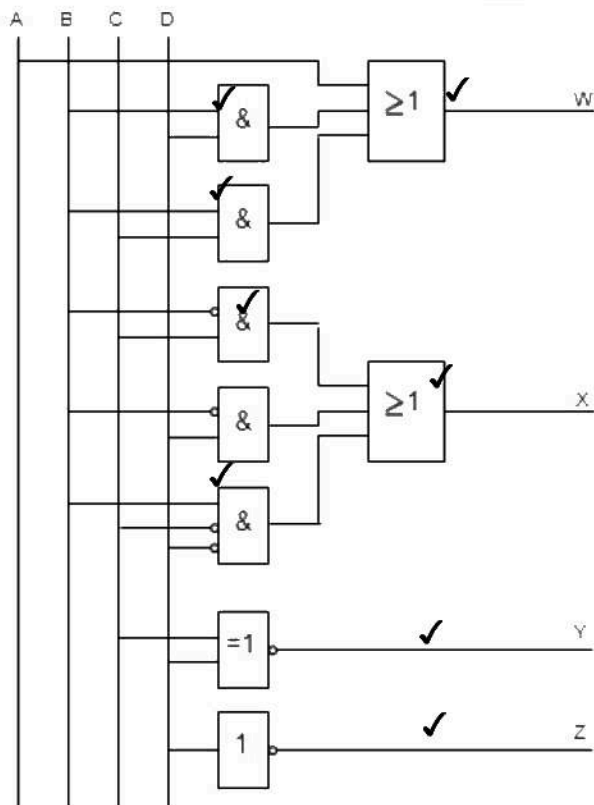
✓

$$Y = \bar{C}\bar{D} + CD = \overline{C \oplus D} \quad \checkmark$$

CD \ AB	00	01	11	10
00	1	1	∅	1
01			∅	
11			∅	∅
10	1	1	∅	∅

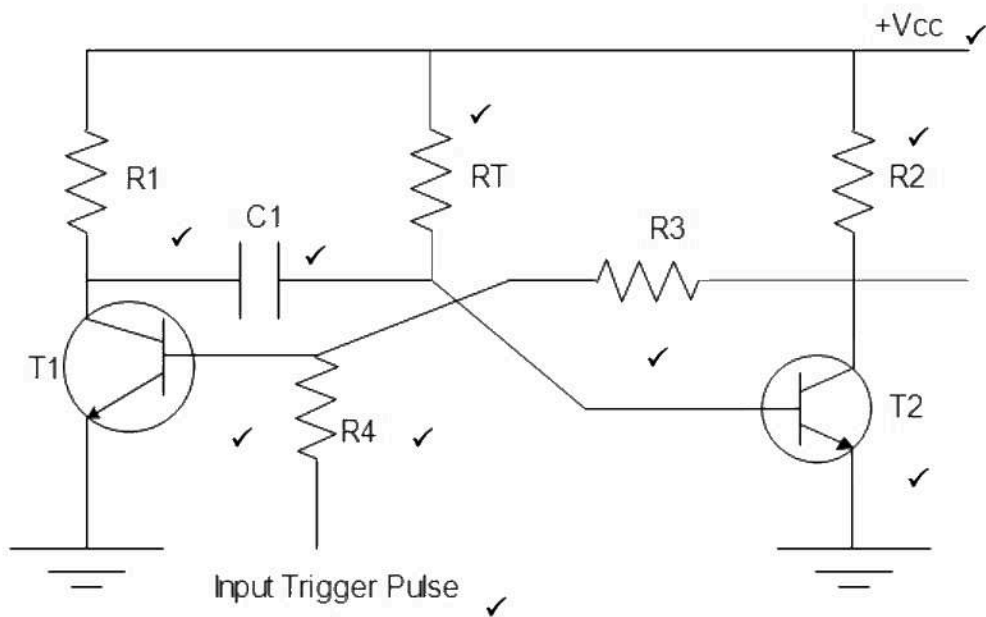
✓

$$Z = \bar{D} \quad \checkmark$$



[20]

VRAAG 5



(Aanvaar ander variasies van die stroombaan) [10]

TOTAAL: 100