higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NASIENRIGLYN

NASIONALE SERTIFIKAAT

SYFERELEKTRONIKA N4

9 APRIL 2018

Hierdie nasienriglyn bestaan uit 8 bladsye.

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Kopiereg voorbehou

VRAAG 1

1.1 Die grondgetal ("radix") is 10. (1)

1.2 Alle komponente van 'n rekenaar werk met twee toestande, naamlik die aan-toestand en die af-toestand. (2)

1.3 'n Beswaarde kode is een waar 'n vaste waarde aan elke binêre getal toegeken word.✓✓
Voorbeeld: 8421, 2421, 7421, 5211, 4221✓
(Enige1) (3)

1.4 3 (1)

1.5 Dit is die tyd dit neem vir die navolger ("sequel") om deur 'n stelsel te beweeg. (2)

1.6 1.6.1 X
1.6.2 ABC
1.6.3 1
1.6.4 A + B
1.6.5 B + A
(5 × 1) (5)

1.7 8421 8421 8421
0110 0110 1101✓
6 6 13
-3 -3 -3
3 3 10 ✓
= 33 A✓ (3)
[17]

VRAAG 2

2.1 $FE,7_{16} = 11111110,0111_2$✓
$1D,5_{16} = 00011101,0101_2$✓

= 00011101.0101 2de komplement = 11100010,1010
+1
11100010,1011✓

Dra oor1

11111110,0111
+ 11100010,1011
11100001,0010✓✓

Dus $1110001,0010 = 225,125_{10}$✓ (6)

2.2 2.2.1 $3A,E7_{16} = 00111010,11100111_2$✓
$15,0625_{10} = 1111,0001_2$✓

11101011100111
11110001✓

11101011100111
00000000000000
00000000000000
00000000000000
11101011100111
11101011100111
11101011100111
$110011111,111111100111_2$✓✓

Dus $110011111,111111100111_2 = 637,7747_8$✓ (6)

2.2.2 $1010110,1 \div 11011_2$

11,001 ✓✓
110110 √10101101000
- 110110
1000001
-110110
1011000
-110110
100010✓✓✓

Dus $11,001_2 = 3,1_8$✓ (6)

2.2.3 $-17,25_{10} = 010001,01_2$ 1-komplement 101110,10✓

$-12,5_{10} = 001100,10_2$ 1-komplement 110011,01✓

Dra oor 1

101110,10
110011,01

100001,11
+1

100010,00 ✓

011101,11 ✓

Dus $11101,11_2 = -29,75_{10}$✓✓ (6)
[24]

VRAAG 3

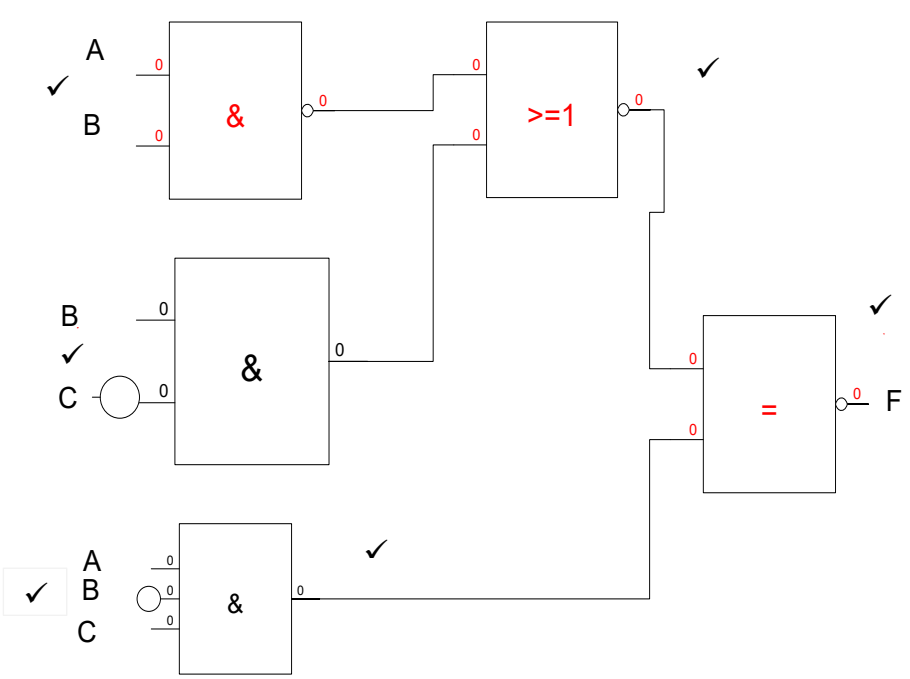
3.1 3.1.1

$F = AB\bar{C}B + ABC\bar{D} + \bar{A}\bar{B}\bar{C}D + \bar{A}\bar{B}C\bar{D}$
$= AB\bar{C}D + ABC\bar{D} + \bar{A}\bar{B}\bar{C}D + \bar{A}\bar{B}C\bar{D}$
$= AB(C \oplus D) + \bar{A}\bar{B}(C \oplus D)$ ✓
Laat $C \oplus D = K$ ✓
$= ABK + \bar{A}\bar{B}K$ ✓
$= (AB + \bar{A}\bar{B})K$ ✓
$= (A \oplus B)K$ ✓
$= (A \oplus B)(C \oplus D)$ ✓ (6)

3.1.2

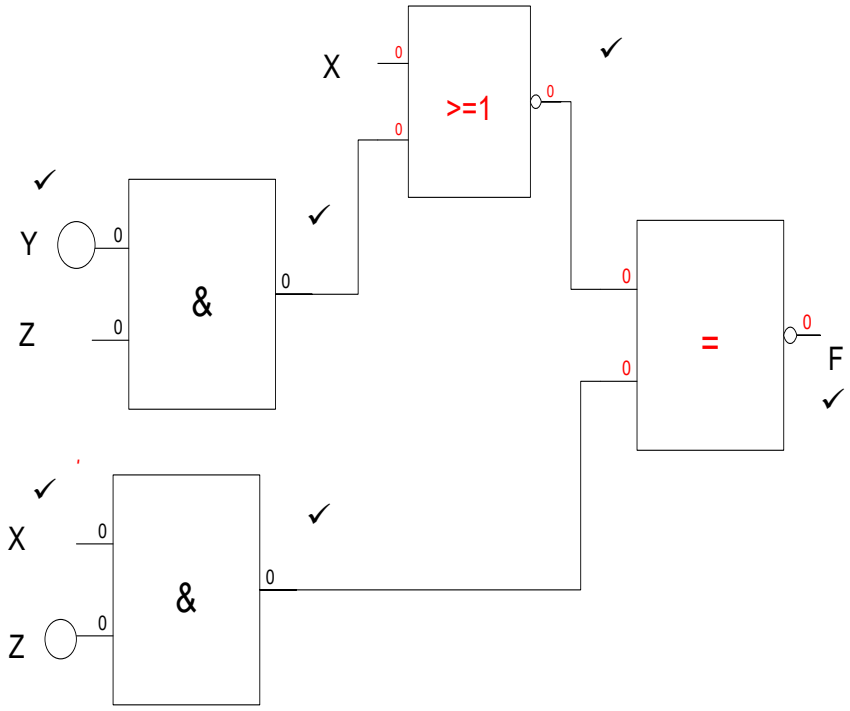
$F = C(A + \bar{B}) + A(B + \bar{C}) + \bar{A}B$
$= AC + \bar{B}C + AB + A\bar{C} + \bar{A}B$ ✓✓
$= A(C + \bar{C}) + B(A + \bar{A}) + \bar{B}C$ ✓✓
$= A + B + \bar{B}C$ ✓
$= A + B + C$ ✓ (6)

3.2 3.2.1



(6)

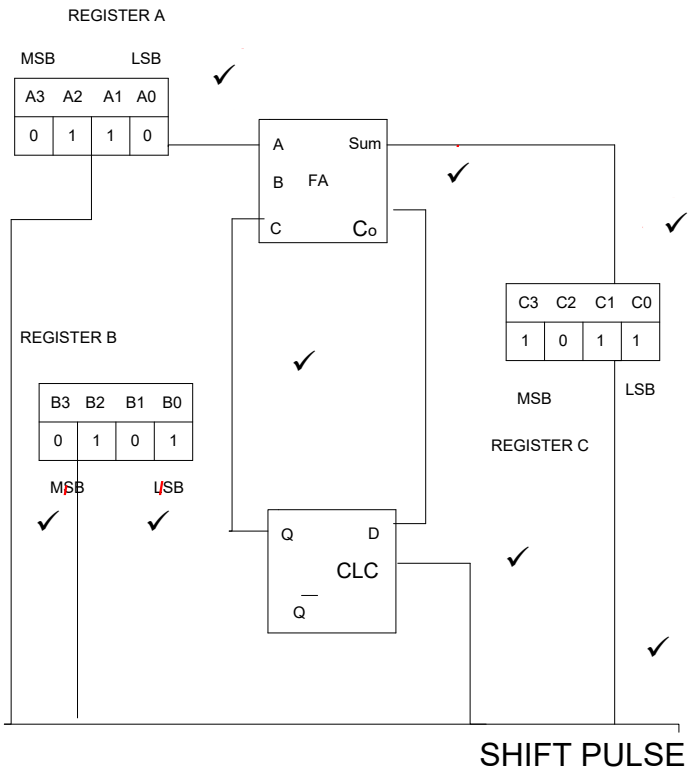
3.2.2



(6)
[24]

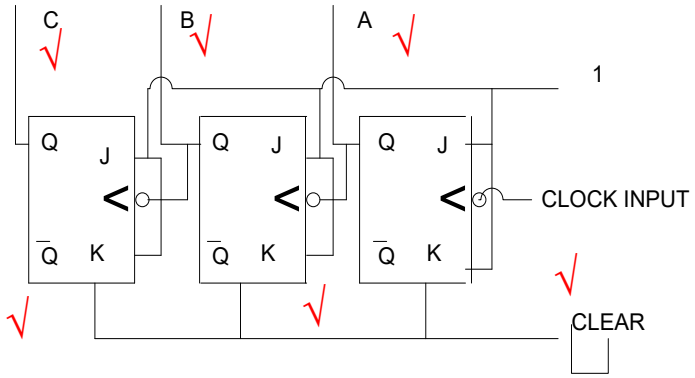
VRAAG 4

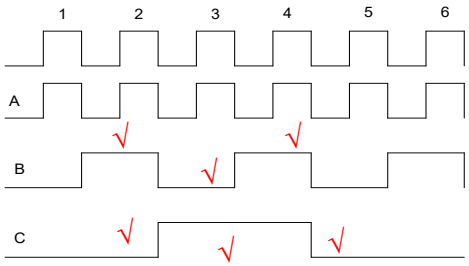
4.1



(8)

4.2



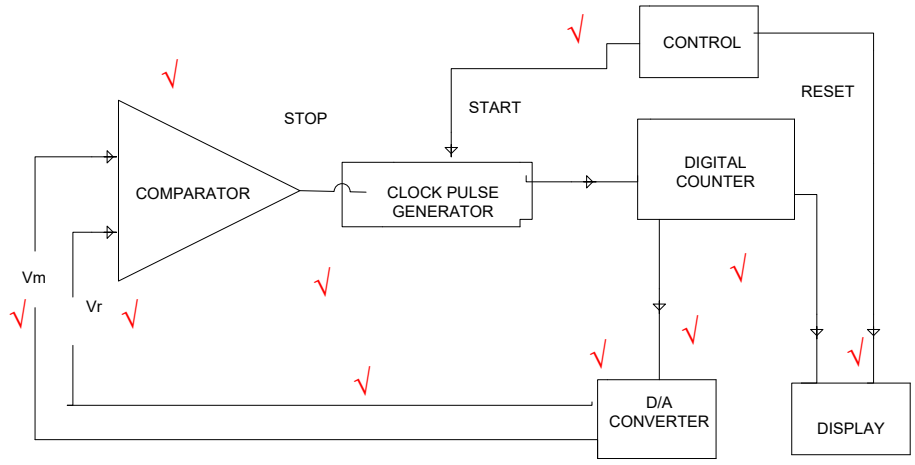


Clock	C	B	A
0	0	0	0✓
1	0	0	1✓
2	0	1	0✓
3	0	1	1✓
4	1	0	0✓
5	1	0	1✓
6	1	1	0✓
7	1	1	1✓

(10)
[18]

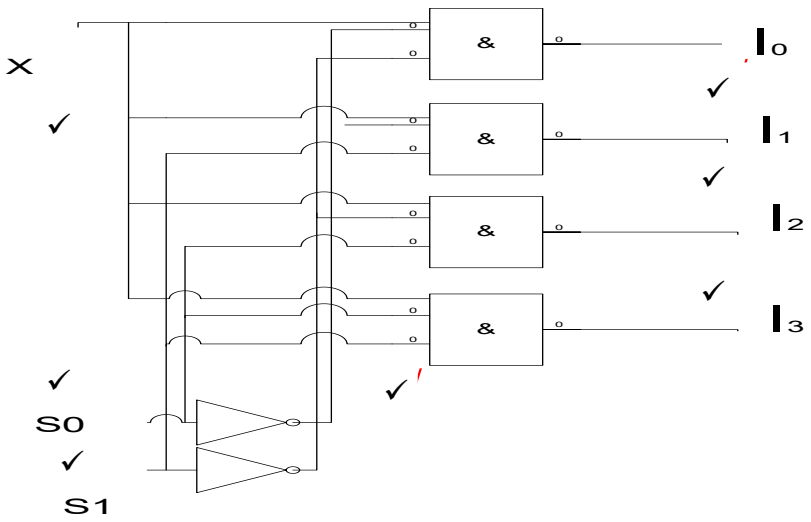
VRAAG 5

5.1



(10)

5.2



(7)
[17]

TOTAAL: 100

Kopiereg voorbehou