higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NASIENRIGLYN

NASIONALE SERTIFIKAAT

SYFERELEKTRONIKA N5

6 APRIL 2018

Hierdie nasienriglyn bestaan uit 7 bladsye.

Kopiereg voorbehou

VRAAG 1

1.1 $135,5_8$ = 001 011 101,101_2 = 1011 101,101✓

$21,A_{16}$ = 0010 0001,1010_2✓ = 1000,101

$$\begin{array}{r} 10,110 \\ 100001101\overline{)10111\,01101,000} \\ \underline{1000\,1101} \\ 110100110 \\ \underline{100001101} \\ 100110010 \\ \underline{100001101} \\ \ldots 1001010 \end{array}$$

$1011010,101_2 \div 100001,101_2 = 10,110_2$ rem 1001010 ÷100001101✓ (6)

Dus: $10,110_2 = 2,68$✓

1.2 $1110001,1_2 - 10001110,111_2$

01110001,100 ⟶ 01110001,100

10001110,111 ⟶ 01110001,000 + 1 ⟶ 01110001,001

No carry 11100010,101

Dus is die antwoord negatief – 11100010,101

11100010,101

Trek 1 af van LSB

Getalsterkte – 00011101,010

Vir heks groepering – 0001 1101, 011

Dus $111001,1_2 - 10001110,111_2 = -0001\ 1101,\ 0110_2 = -1D,6_{16}$ (6)

1.3 B, $C_{16} \times 11,2_8$

B, C_{16} = 1011,1100 = $1011,11_2$ [each hex no. is represented by 4 binary bits]

$11,2_8$ = 001 001, 010 = $1001,01_2$ [each octal no. is represented by 3 binary]

$$\begin{array}{rr} & 101111 \\ & \underline{100101} \\ & 101111 \\ & 10111100 \\ + & \underline{10111100000} \\ & 110100,1011 \end{array}$$

Skuif komma in 4 plekke

110100,1011

Dus $1011,11_2 \times 1001,01_2 = 110100,1011_2$

= 64 + 32 + 8 + 4 + 0,5 + 0,25 + 0,0625

= $108,6875_{10}$ (6)

[18]

VRAAG 2

A	**B**	**C**	**D**		**F**
0	0	0	0		1
0	0	0	1		0
0	0	1	0		1
0	0	1	1		0
0	1	0	0		1
0	1	0	1		1
0	1	1	0		1
0	1	1	1		1
1	0	0	0		1
1	0	0	1		0
1	0	1	0		1
1	0	1	1		0
1	1	0	0		1
1	1	0	1		0
1	1	1	0		1
1	1	1	1		0

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

VANAF KAARTGROEPERINGS

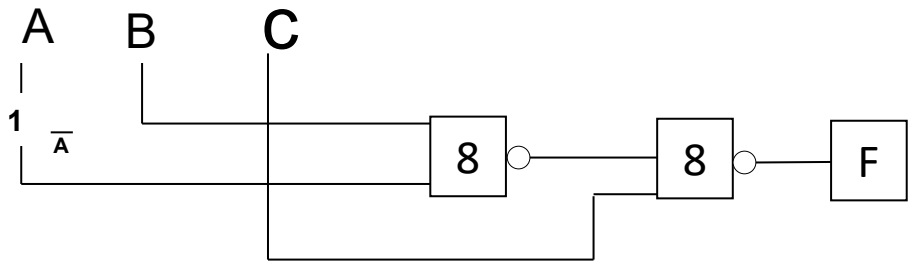
$F = \overline{D} + \overline{A}B$

$= \overline{\overline{\overline{D} + \overline{A}B}}$

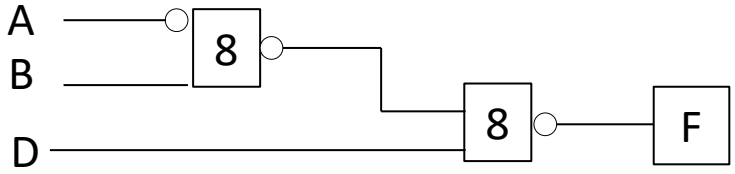
$= \overline{\overline{D}.\overline{\overline{A}B}}$

$= \overline{D.\overline{\overline{A}B}}$

TEKENING



ALTERNATIEF



[18]

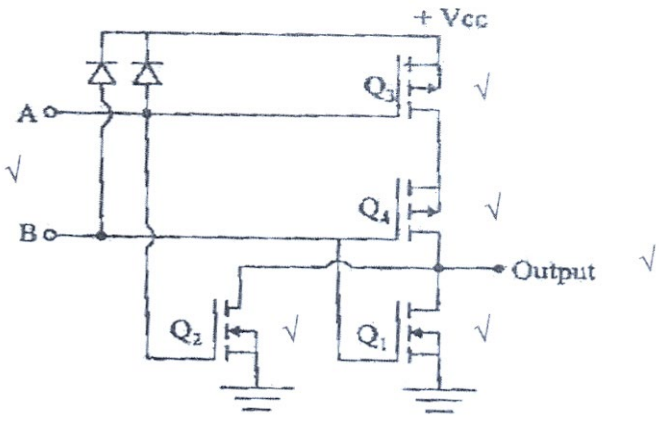
VRAAG 3

3.1 V_{OH} = 30 V; V_{OL} = 0,8 V; V_{IH} = 2,0 V en V_{IL} = 0,4 V

$V_{NH} = V_{OH(MIN)} – V_{IN(MIN)} = 30 – 2 = 28$ V

$V_{NL} = V_{IN(MAX)} – V_{OL(MAX)} = 0,8 – 0,4 = 0,4$ V (2)

3.2



(6)

3.3 3.3.1 KSI – Kleinskaal-integrasie
3.3.2 GSI – Grootskaal-integrasie
3.3.3 BGSI – Baiegrootskaal-integrasie
3.3.4 UGSI – Ultragrootskaal-integrasie
3.3.5 MSI – Mediumskaal-integrasie

(5 × 1) (5)

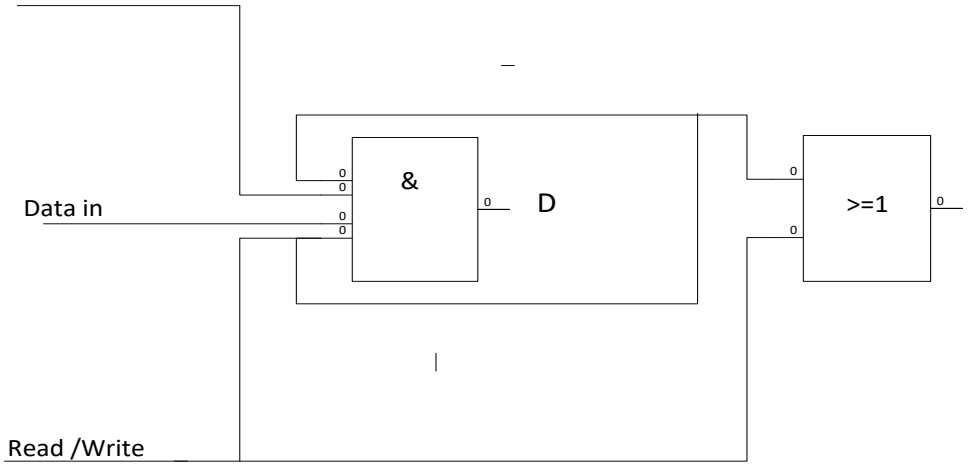
3.4

	SPOED✓	KRAGGEBRUIK✓	PAKDIGTHEID✓
TLL	Vinnig	Hoog	Laag
K-MOH	Stadig	Laag	Hoog

(3 × 1) (3)
[16]

VRAAG 4

4.1



(6)

4.2
- Die RLE (rekenkunde-logika-eenheid)
- Die beheereenheid
- Die geheue-eenheid
- Die toevoereenheid
- Die afvoereenheid (5)

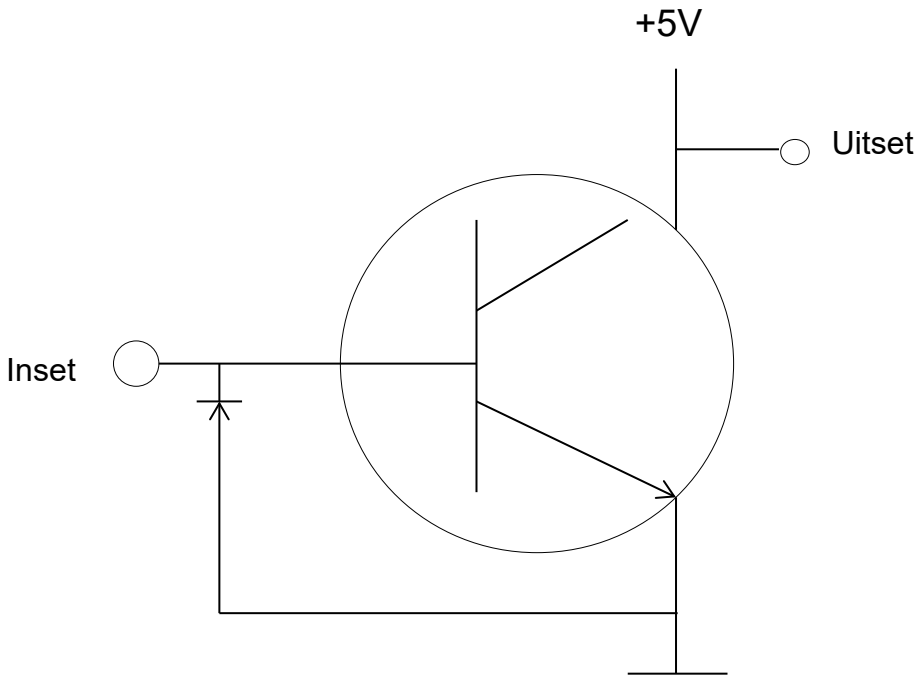
4.3
- Die databus (datastamlyn) dra seine in twee rigtings; dit dra inligting tussen die SVE *(CPU)*, geheues en ander eenhede.
- Die adresbus (adresstamlyn) dra inligting in een rigting; dit dra die adreskode wat gebruik word vir die seleksie van data en eenhede.
- Die beheerbus dra seine in twee rigtings; dit dra instruksiekodes tussen die SVE en ander eenhede. (6)

[17]

VRAAG 5

5.1
- Stil werking
- Betroubaarheid
- Lae koste (3)

5.2



(4)

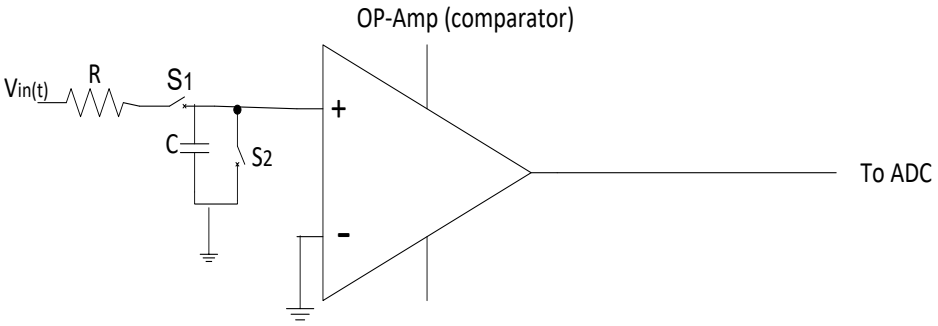
5.2 (4)

5.3 5.3.1 15 meer
5.3.2 20 000 bis/sekonde
(2 × 1) (2)
[9]

VRAAG 6

6.1 $Vo = \frac{A \times Vin \times tyd}{RC} = \frac{2424 \times 1 \times 10^{-3}}{100 \times 10^{3} \times 100 \times 10^{-6}} = 0{,}4848\ V$ (2)

6.2



(5)

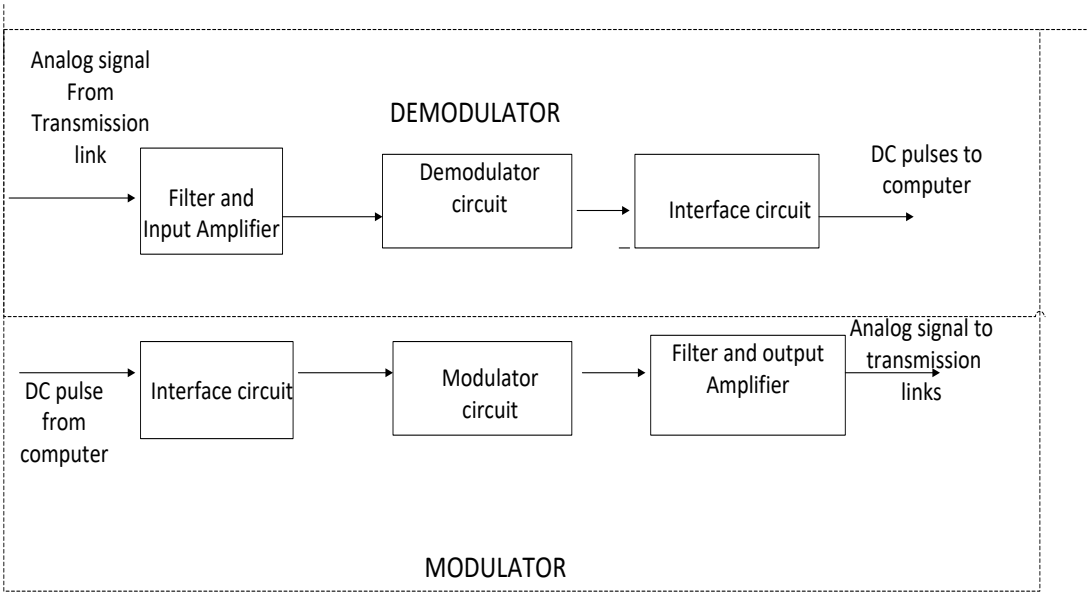
6.3 6.3.1 Lineariteit – 'n lineêre fout is 'n afwyking van die ideale uitset van 'n SAO (*DAC*).

6.3.2 Drumpel – dit is die minimum en maksimum spanningsvlak wat 'n logikatoestand bepaal.

(2 × 2) (4)
[11]

VRAAG 7

7.1



(10)

7.2 Om digitale toestelle oor telefoonlyne te konnekteer (1)
[11]

TOTAAL: 100

Kopiereg voorbehou