higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NASIENRIGLYN

NASIONALE SERTIFIKAAT

LOGIKASTELSELS N2

9 April 2021

Hierdie nasienriglyn bestaan uit 7 bladsye.

Kopiereg voorbehou

VRAAG 1

1.1 10 (1)

1.2 16 (1)

1.3 1.3.1 45 + 66

Code	32	16	8	4	2	1
45 =	**1**	**0**	**1**	**1**	**0**	**1**

✓

Code	64	32	16	8	4	2	1
66 =	**1**	**0**	**0**	**0**	**0**	**1**	**0**

✓

$$\begin{array}{r} 1\,0\,1\,1\,0\,1 \\ +\ 1\,0\,0\,0\,0\,1\,0 \\ \hline 1\,1\,0\,1\,1\,1\,1_2 \checkmark \end{array}$$

$1\,1\,0\,1\,1\,1\,1_2 = 2^6 + 2^5 + 2^3 + 2^2 + 2^1 + 20$ ✓
$= 64 + 32 + 8 + 4 + 2 + 1$
$= 111_{10}$ ✓

1.3.2 56 – 23

Code	32	16	8	4	2	1
56 =	**1**	**1**	**1**	**0**	**0**	**0**

✓

Code	16	8	4	2	1
23 =	**1**	**0**	**1**	**1**	**1**

✓

$$\begin{array}{r} 1\,1\,1\,0\,0\,0 \\ -\ 1\,0\,1\,1\,1 \\ \hline 1\,0\,0\,0\,0\,1_2 \checkmark \end{array}$$

$1\,0\,0\,0\,0\,1_2 = 2^5 + 2^0$ ✓
$= 32 + 1$
$= 33_{10}$ ✓

1.3.3 $36 \div 4$

Code	32	16	8	4	2	1
36 =	**1**	**0**	**0**	**1**	**0**	**0**

✓

Code	4	2	1
4 =	**1**	**0**	**0**

✓

$$\begin{array}{r} 1\,0\,0\,1_2 \\ 1\,0\,0\overline{)\,1\,0\,0\,1\,0\,0} \\ -1\,0\,0 \\ \hline 0\,1\,0\,0 \\ -1\,0\,0 \\ \hline 0 \end{array}$$

✓ ✓

$1\,0\,0\,1_2 = 2^3 + 2^0$
$= 8 + 1$
$= 9_{10}$ ✓

1.3.4 7×15

Code	4	2	1
7 =	**1**	**1**	**1**

✓

Code	8	4	2	1
15 =	**1**	**1**	**1**	**1**

✓

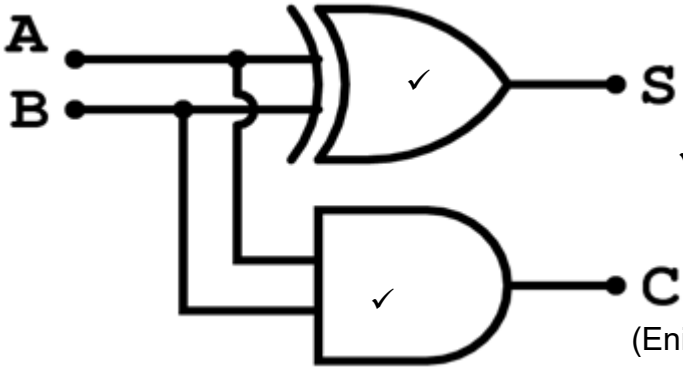
$$\begin{array}{r} 1\,1\,1\,1 \\ \times\quad 1\,1\,1 \\ \hline 1\,1\,1\,1 \\ 1\,1\,1\,1\,0 \\ +\ 1\,1\,1\,1\,0\,0 \\ \hline 1\,1\,0\,1\,0\,0\,1_2 \end{array}$$

✓ ✓

$1\,1\,0\,1\,0\,0\,1_2 = 2^6 + 2^5 + 2^3 + 2^0$
$= 64 + 32 + 8 + 1$
$= 105_{10}$ ✓

(4 × 5) (20)

1.4



✓ Een punt vir korrektheid

(Enige ander relevante skets) (3)

[25]

VRAAG 2

2.1 2.1.1

1001 0110 1011

9 6 11
-3 -3 -3
6 3 8

100101101011 XS3 = 638_{10} ✓✓✓

2.1.2

3 7 6
8421 8421 8421
0101 1001 1010

376 = 010110011010 8421BCD ✓✓✓

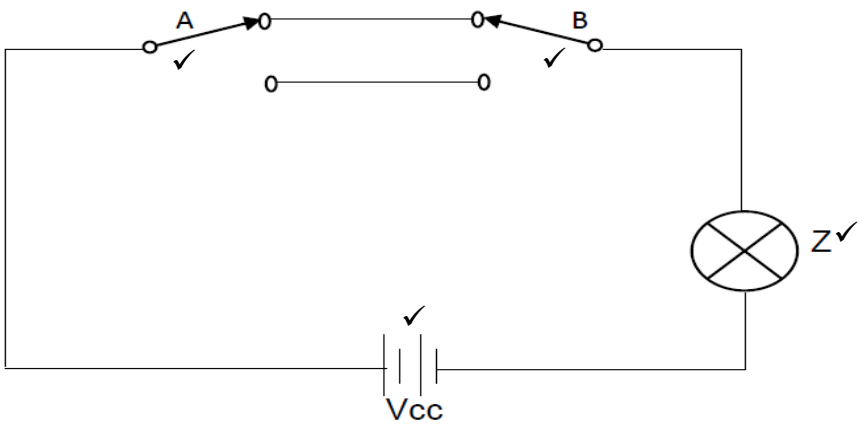
2.1.3

1101 1100 0011
2421 2421 2421
7 6 3

110111000011 2421BCD = 763_{10} ✓✓✓

(3 × 3) (9)

2.2



(4)

2.3 Beswaarde kode is 'n kode waardeur die waarde van die posisie van elke binêre syfer gespesifiseer kan word. (2)

2.4

Desimaal	BCD (8421)	XS3
0	0000	0011 ✓
1	0001	0100 ✓
2	0010	0101 ✓
3	0011	0110 ✓
4	0100	0111 ✓
5	0101	1000 ✓
6	0110	1001 ✓
7	0111	1010 ✓
8	1000	1011 ✓
9	1001	1100 ✓

(10)
[25]

VRAAG 3

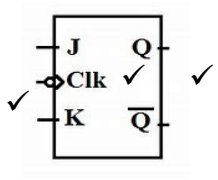
3.1
3.1.1 A
3.1.2 D
3.1.3 A
3.1.4 A
3.1.5 B
3.1.6 C
3.1.7 C

(7 × 1) (7)

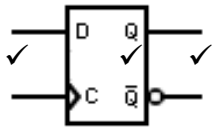
3.2
- DVD
- Slapskyf ('Floppy disc')
- CD ROM
- Stiffie
- Geheuestokkie
- Hardeskyf
- Ponskaarte
- Magneetband

(Enige 5 × 1) (5)

3.3 3.3.1

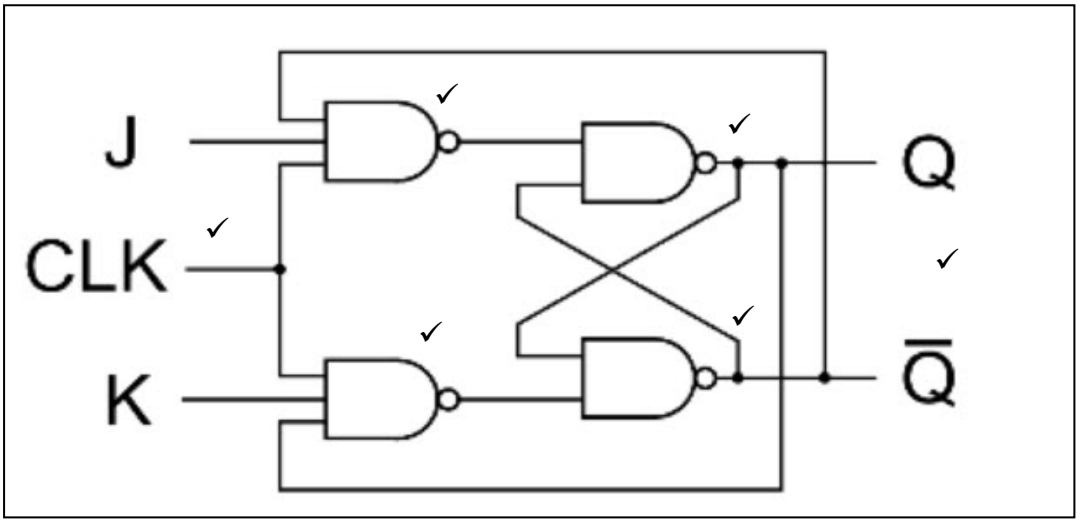


3.3.2



(2 × 3) (6)

3.4



(6)

3.5
- Geen ontoelaatbare kombinasie kan op die insette geplaas word nie.
- Dit kan maklik na enige ander flip-flop verander word (Enige 1) (1)

[25]

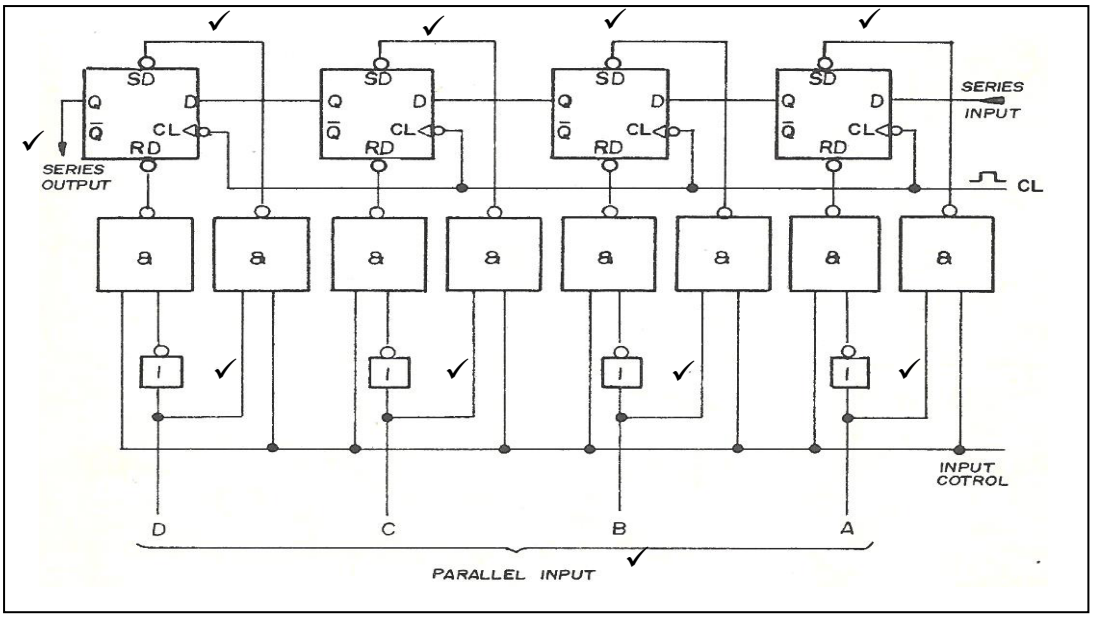
VRAAG 4

4.1 14 hekke (2)

4.2 Dit word 'n serie-teller genoem omdat die uitset van die eerste flip-flop die klok van die volgende flip-flop is. (2)

4.3
- Serie na parallel omsetter
- Parallel na serie omsetter
- Vertragingslyn
- Ringteller
- Gedraaideringteller
- Volgordeskepper (Enige 6 × 1) (6)

4.4



(10)

4.5

Klokpuls	Q_8	Q_4	Q_2	Q_1 ✓
0	0	0	0	0
1	0	0	0	1 ✓
2	0	0	1	0
3	0	0	1	1 ✓
4	0	1	0	0
5	0	1	0	1
6	0	1	1	0 ✓
7	0	1	1	1
8	1	0	0	0
9	1	0	0	1 ✓

(5)
[25]

TOTAAL: 100

Kopiereg voorbehou