



higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NASIENRIGLYN

NASIONALE SERTIFIKAAT

INGENIEURSWETENSKAP N1

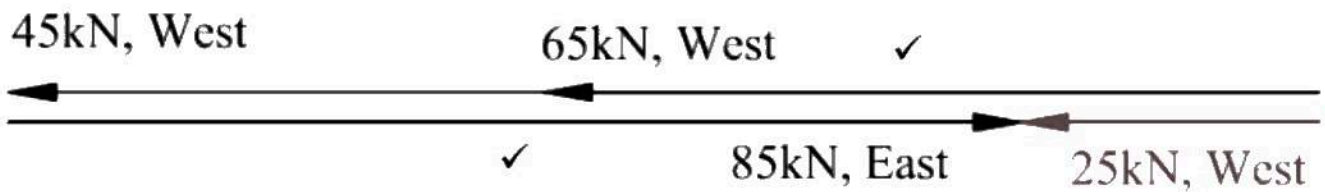
8 Augustus 2024

Hierdie nasienriglyn bestaan uit 9 bladsye.

VRAAG 1

- 1.1 1.1.1 Die gravitasiekrag wat op 'n liggaam inwerk✓ (1)
- 1.1.2 Dit is 'n aanduiding van die hoeveelheid en digtheid van materie in 'n liggaam✓ (1)
- 1.1.3 'n Vektor is 'n hoeveelheid wat oor grootte en rigting beskik✓ (1)
- 1.1.4 'n Skalaar is 'n hoeveelheid wat slegs oor grootte beskik✓ (1)

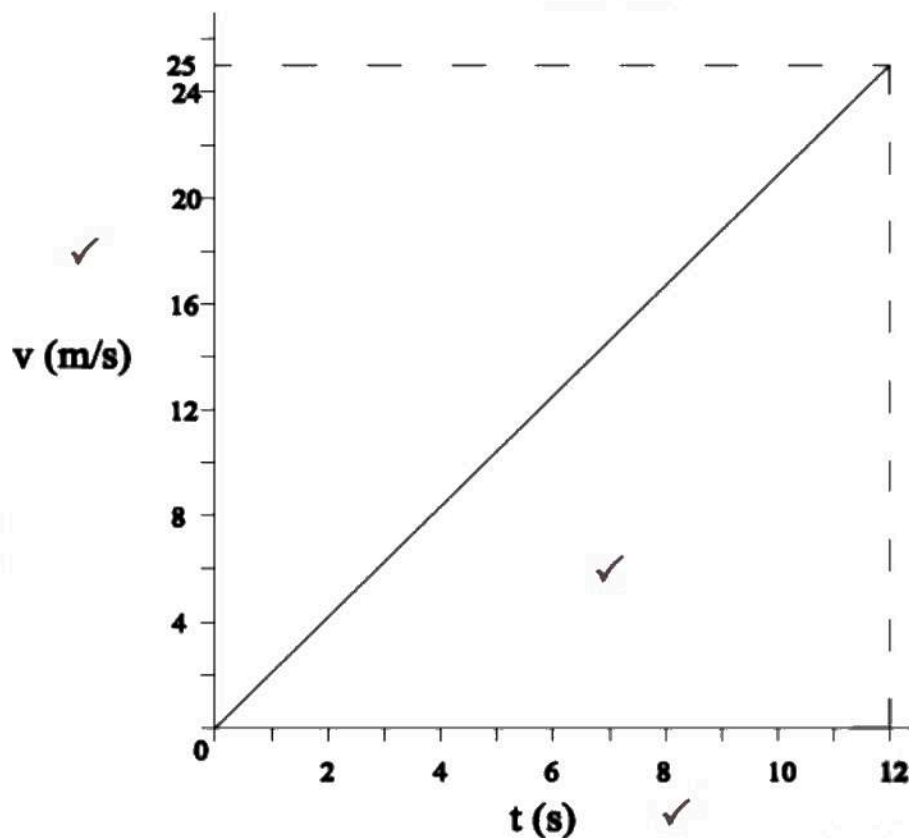
1.2



✓✓

R = 25 kN, Oos✓ of 2 punte vir die skets en 1 punt vir die resultant en rigting (3)

1.3



(3)

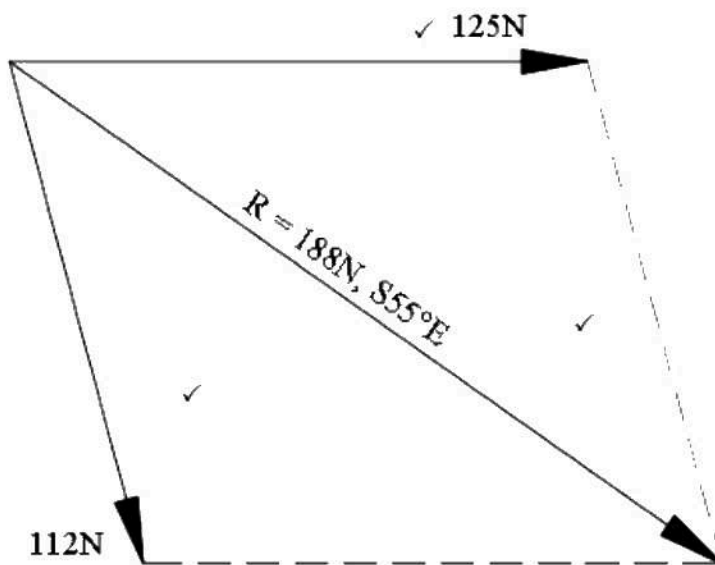
- 1.4 1.4.1 $a = v/t$
 $a = 25/12$
 $a = 2,083 \text{ m/s}^2$ ✓ (1)

1.4.2 $a = v/t$
 $v = a \cdot t$
 $v = 2,083 \times 5$
 $v = 10,415 \text{ m/s} \checkmark$ (1)

1.4.3 $a = v/t$
 $t = v/a$
 $t = 12/2,083$
 $t = 5,761 \text{ s} \checkmark$ (1)
[13]

VRAAG 2

2.1



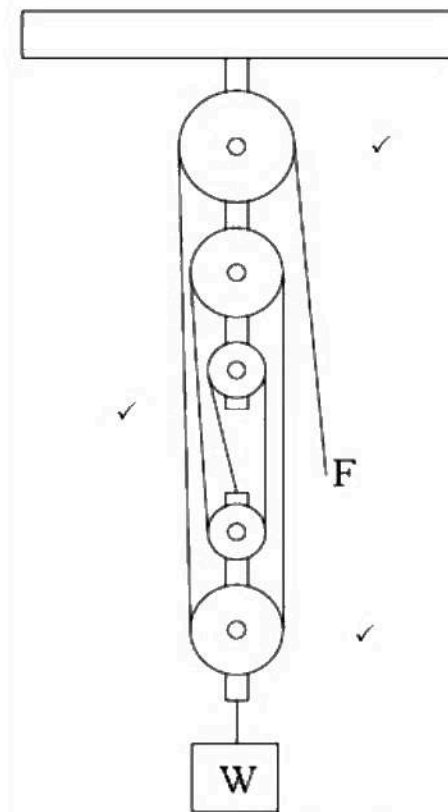
(3)

2.2

2.2.1 $MA = \text{las (W)}/\text{hyskrag (f)}$
 $MA = (320 \times 9.8)/210 \checkmark$
 $MA = 14,933 \checkmark$ (2)

2.2.2 $VR = \text{hyskragafstand}/\text{lasafstand}$
 $VR = 1,74/0,345 \checkmark$
 $VR = 5,043 \checkmark$ (2)

2.3



(3)

2.4

Kloksgewyse moment = antikloksgewyse moment

$F \cdot S = F \cdot S$

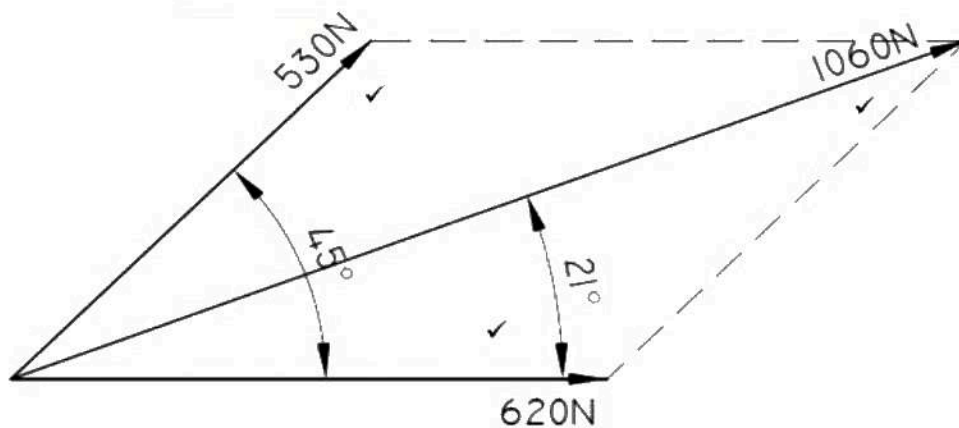
$P \times 25 = 165 \times 55$ ✓

$25P = 9075$

$P = 363 \text{ N}$ ✓

(2)

2.5



1060 N ✓

21° ✓

Diagram ✓

(3)

2.6

2.6.1

$DR = E_{DIST}/L_{DIST}$

DR = aantal toue wat katrolle ondersteun ✓

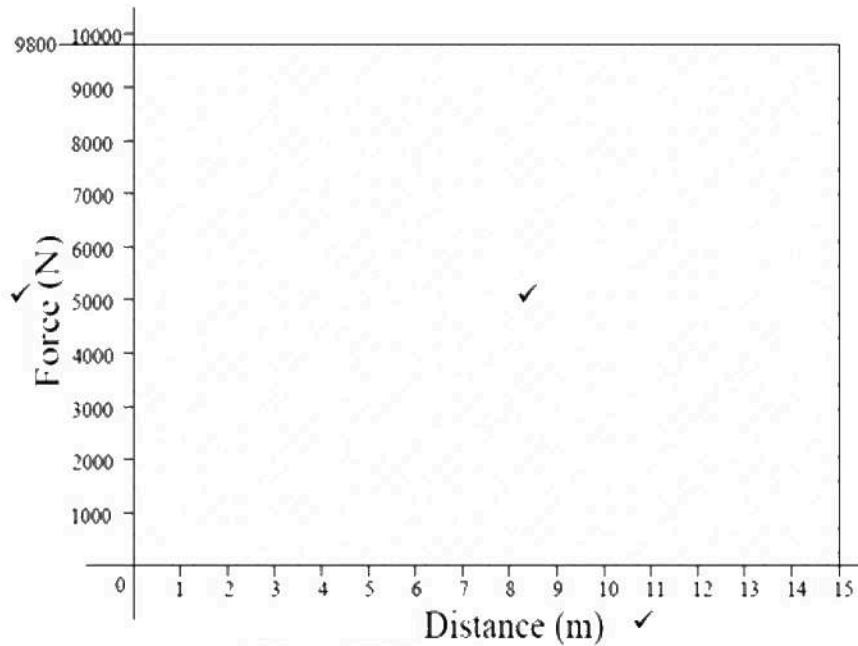
DR = 4 ✓

2.6.2 $MA = L/E$
 $MA = 860/60 \checkmark$
 $MA = 14,333 \checkmark$

(2)
[19]

VRAAG 3

3.1 3.1.1



(3)

3.1.2 $W = F.s$
 $W = 9800 \times 15 \checkmark$
 $W = 147000J \checkmark$
 $W = 147 \text{ kJ}$

(2)

3.2 3.2.1 Km/h tot m/s $75/3,6 = 20,833 \text{ m/s}$

$P = F.v$
 $F = p/v$
 $F = 1100/20,833 \checkmark$
 $F = 52,8N \checkmark$

(2)

3.2.2 $P = W / t$
 $W = P.t$
 $W = 1100 \times (6 \times 60) \checkmark$
 $W = 39600 J \checkmark$
 $W = 396kJ$

(2)

3.3 3.3.1 Kinetiese energie $\checkmark$
 3.3.2 Warmte-energie $\checkmark$
 3.3.3 Chemiese energie $\checkmark$

(1)

(1)

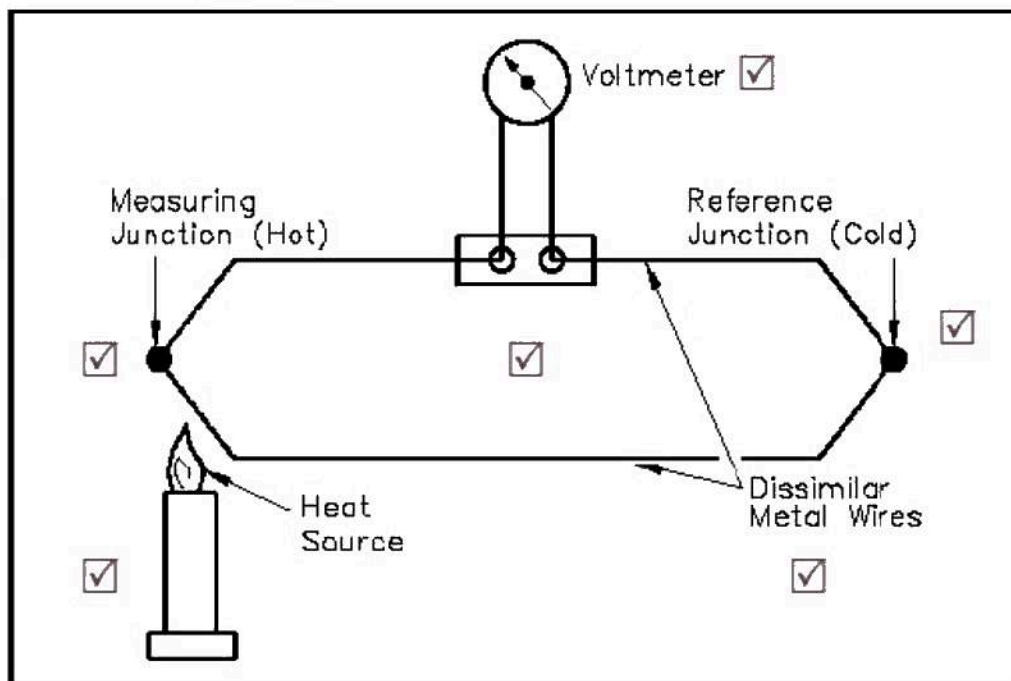
(1)

[12]

VRAAG 4

- 4.1 4.1.1 Hoë vriespunt✓
Duur
Giftig (1)
- 4.1.2 Lae kookpunt✓
Nie maklik sigbaar nie
Kleef aan glas
Sit nie eenvormig uit nie (1)
- 4.2 4.2.1 Bimetaalstrook✓ (1)
- 4.2.2 Verskil in lineêre uitsetting van verskillende materiale. ✓ (1)
- 4.3 4.3.1 $\Delta t = t_f - t_0$
 $\Delta t = 34 - 18$ ✓
 $= 16\text{ }^\circ\text{C}$ ✓ (2)
- 4.3.2 $\Delta l = l_f - l_0$
 $\Delta l = 150,005 - 149,925$ ✓
 $\Delta l = 80\text{ mm}$ ✓ (2)
- 4.4 $Q = m.c.\Delta t$
 $Q = 150 \times 380 \times (650 - 25)$ ✓
 $Q = 35,625\text{ MJ}$ ✓ (2)
- 4.5 4.5.1 Verandering van fase✓ (1)
- 4.5.2 Verandering van kleur✓ (1)

4.6

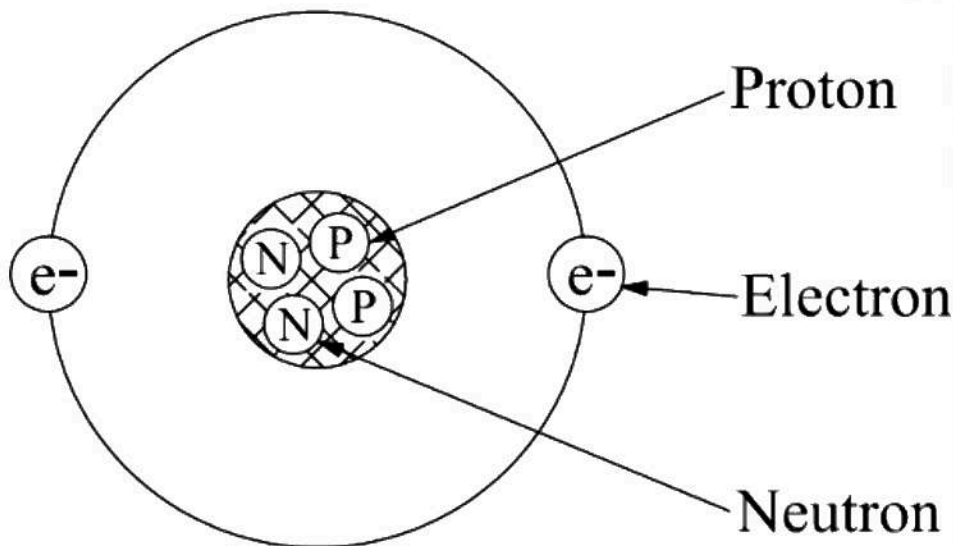


(3)

4.7	4.7.1	Geleier✓	(1)
	4.7.2	Konveksie✓	(1)
	4.7.3	Straling✓	(1)
			[18]

VRAAG 5

5.1

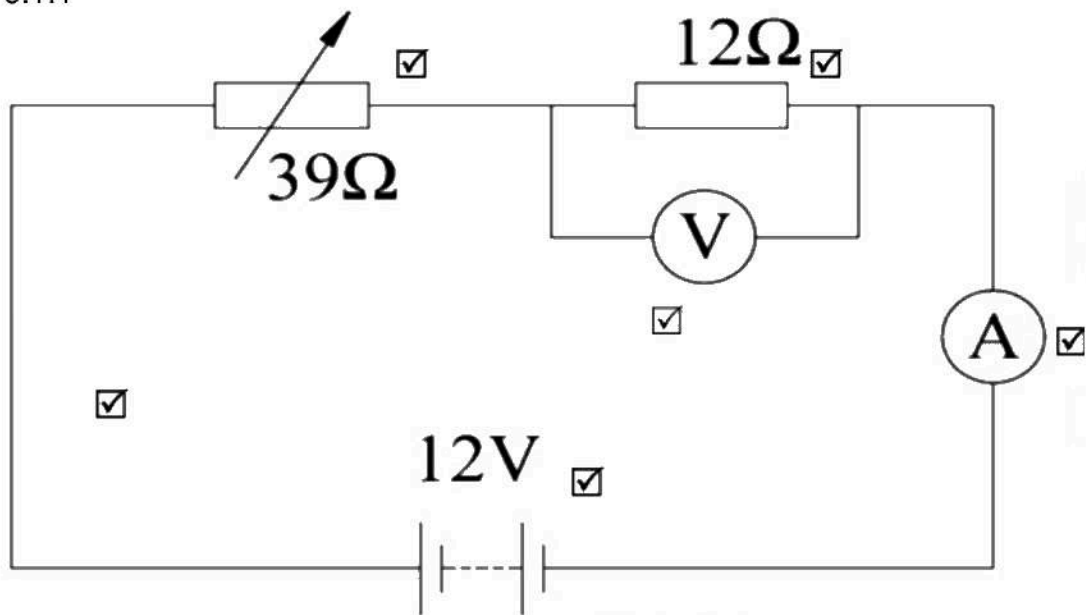


1 punt vir 2 elektrone
1 punt vir 2 protone
1 punt vir 2 neutrone

5.2	5.2.1	Molekules is ver uitmekaar.✓	(1)
	5.2.2	Hard✓ Bros✓ Hoë digtheid Beweging van deeltjies is stadig Molekules is naby mekaar – feitlik nie saamdrukbaar nie	(2)
5.3	Ione word gevorm wanneer 'n atoom 'n elektron wen of verloor.✓		(1)
5.4	5.4.1	Onwaar✓	(1)
	5.4.2	Waar✓	(1)
	5.4.3	Waar✓	(1)
	5.4.4	Onwaar✓	(1)
	5.1.5	Onwaar✓	(1)
			[12]

VRAAG 6

6.1 6.1.1



(4)

6.1.2 $R_T = R_1 + R_2$
 $R_T = 39 + 12$ ✓
 $R_T = 51 \Omega$ ✓

(2)

6.1.3 $I = V/R$
 $I = 12/51$ ✓
 $I = 0,235 A$ ✓

(2)

6.2 Die weerstand sal verhoog✓

(1)

6.3 Die weerstand sal afneem✓

(1)

6.4 Dwarsdeursneeoppervlakte✓
 Tipe materiaal✓
 Lengte✓

(3)

6.5 6.5.1 $I = P/V$
 $I = 1500/220$ ✓
 $I = 6,818 A$ ✓

(2)

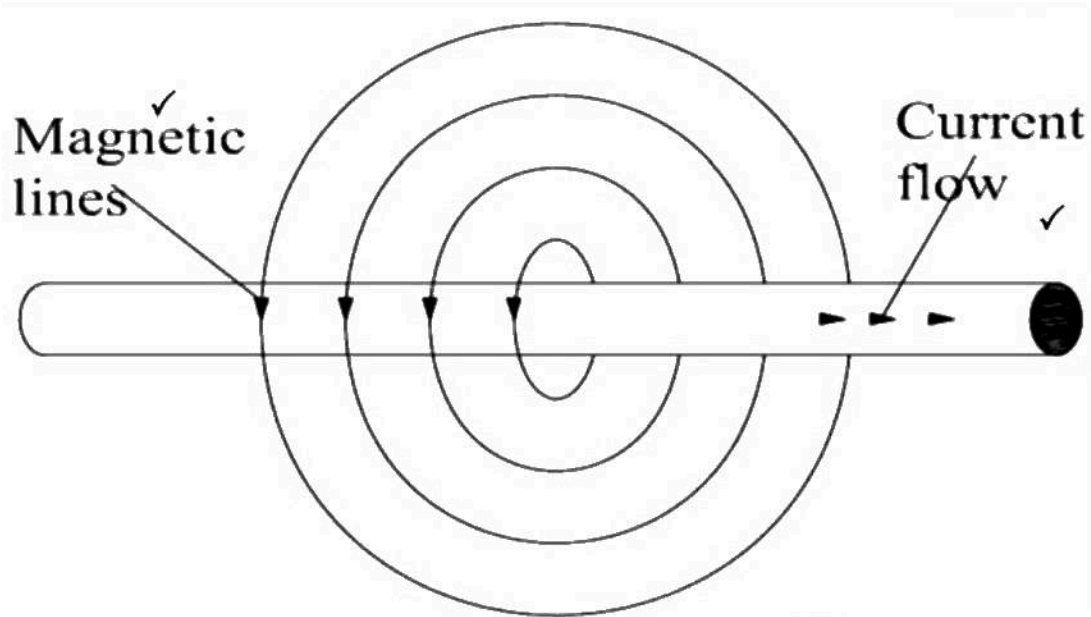
6.5.2 $R = V/I$
 $R = 220/6,818$ ✓
 $R = 32,268 \Omega$ ✓

(2)

6.6 $Q = V.I.t$
 $Q = 220 \times 13,5 \times (15 \times 60)$ ✓
 $Q = 2673000 J$ ✓
 $Q = 2,673 MJ$

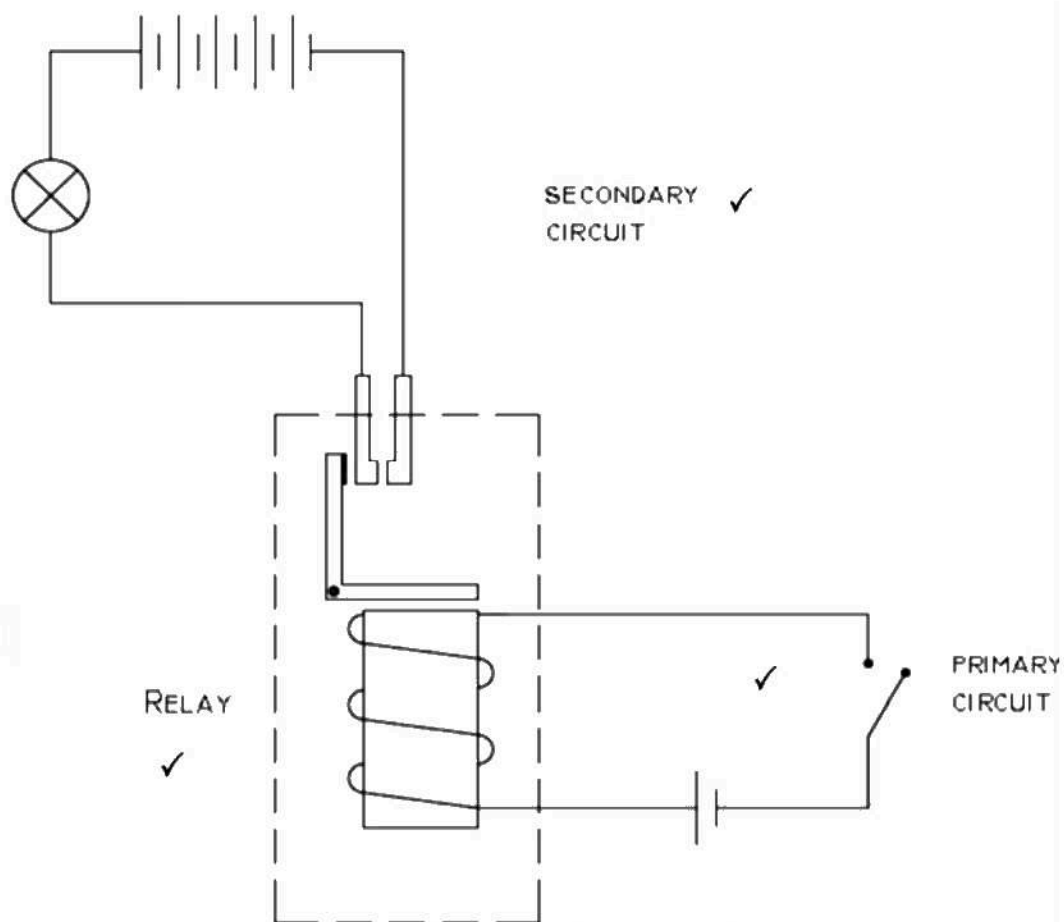
(3)

6.7



(2)

6.8



(1 punt vir die korrekte

(4)

tekening)

[26]

TOTAAL: