



Province of the
EASTERN CAPE
EDUCATION

**NATIONAL
SENIOR CERTIFICATE/
NASIONALE SENIOR
SERTIFIKAAT**

GRADE/GRAAD 11

NOVEMBER 2018

**TECHNICAL SCIENCES P1
TEGNIESE WETENSKAPPE V1
MARKING GUIDELINE/NASIENRIGLYN**

MARKS/PUNTE: 150

This marking guideline consists of 9 pages./
Hierdie nasienriglyn bestaan uit 9 bladsye.

QUESTION/VRAAG 1

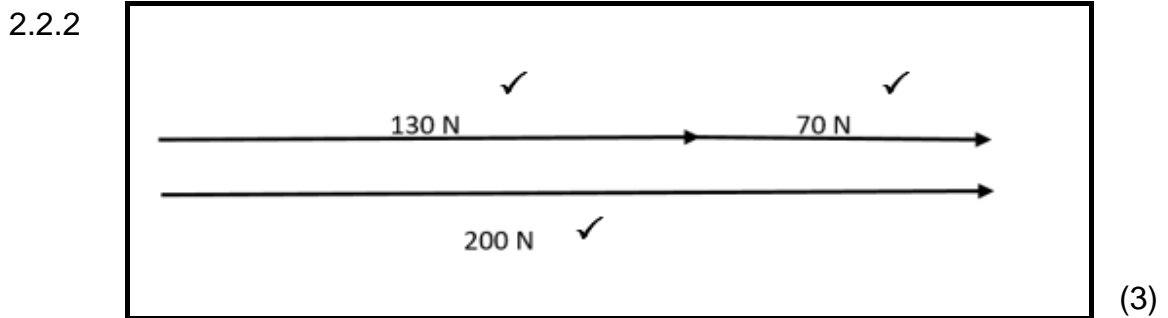
1.1	A	✓✓	(2)
1.2	A	✓✓	(2)
1.3	B	✓✓	(2)
1.4	B	✓✓	(2)
1.5	A	✓✓	(2)
1.6	D	✓✓	(2)
1.7	A	✓✓	(2)
1.8	D	✓✓	(2)
1.9	B	✓✓	(2)
1.10	C	✓✓	(2)
			[20]

QUESTION/VRAAG 2

2.1 2.1.1 4 m ✓✓ (2)

2.1.2 7 m west / wes ✓✓ (2)

2.2 2.2.1 (Resultant of two or more vectors) is a single vector which has the same effect as two or more vectors acting together. ✓✓
(Die resultant van twee of meer vektore) is 'n enkele vektor wat dieselfde effek het as twee of meer vektore wat saam toegepas word. ✓✓ (2)



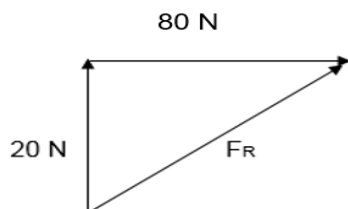
2.3.1 Vectors that are in the same plane. ✓✓
Vektore wat op dieselfde vlak is. (2)

2.3.2 Non-contact force – Gravitational force ✓✓
Contact force – F₁ or F₂ or Force of rope ✓✓
Nie-kontakkrag – Swaartekrag ✓✓
Kontakkrag – F₁ of F₂ of Krag van tou ✓✓ (4)

2.3.3 F_g = mg = (10)(9,8)✓
= 98 N downward / afwaarts ✓

F₁ = 118 N upward / opwaarts
Resultant of vertical force, F_V = F_g + F₁ ✓
(Resultant van vertikale krag) = (-98) + 118 ✓
= 20 N upward / opwaarts ✓ (5)

2.3.4



$$F_R^2 = (F_V)^2 + F_2^2 \quad \checkmark$$
$$= (20)^2 + (80)^2 \quad \checkmark$$
$$= 6800$$
$$F_R = 82,46 \text{ N} \quad \checkmark$$

(3)
[23]

QUESTION/VRAAG 3

3.1 3.1.1 $T_{1V} = T_1 \sin \theta$ ✓
 $T_{1V} = (5)(\sin 18^\circ)$ ✓
 $T_{1V} = 1,55 \text{ N}$ ✓ (3)

3.1.2 $T_{2V} = T_1 \sin \theta$
 $T_{2V} = (7)(\sin 20^\circ)$ ✓
 $T_{2V} = 2,39 \text{ N}$ ✓ (2)

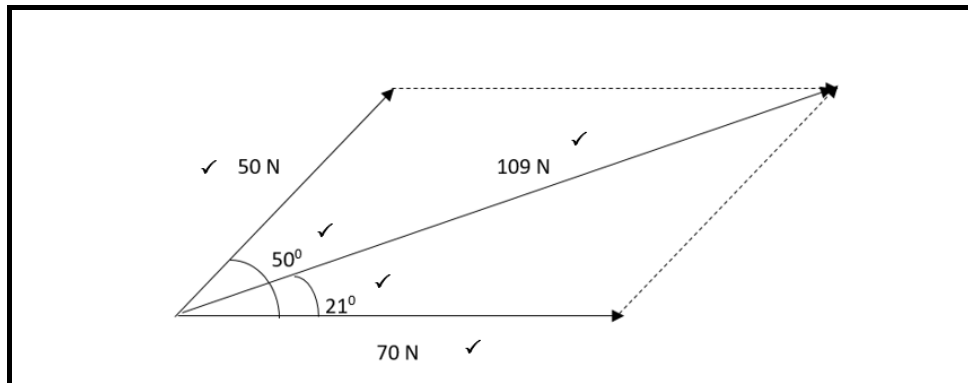
3.1.3 $F_{RV} = T_{1V} + T_{2V}$ ✓
 $= 1,55 + 2,39$ ✓
 $= 3,94 \text{ N}$ ✓ (3)

3.1.4 $F_{RV} = F_g$ ✓
 $3,94 = mg$
 $3,94 = m(9,8)$ ✓
 $m = 0,40 \text{ kg}$ ✓ (4)

- 3.2 3.2.1 If two forces acting at a point can be represented by the adjacent sides of a parallelogram both in magnitude and direction, then the diagonal from the starting point gives the resultant of the two forces. ✓✓

Indien twee kragte op 'n punt inwerk kan hulle voorgestel word deur die aanliggende sye van 'n parallellogram in grootte en rigting en die hoeklyn van die beginpunt gee die resultant van die twee kragte. ✓✓ (2)

3.2.2



Resultant Force = 109 N ✓ at an angle 21° with the 70 N force. ✓
 (Accept any value of angle between 20° and 21°)
Resultante krag = 109 N ✓ teen 'n hoek van 21° met die 70 N krag ✓
(Aanvaar enige waarde vir die hoek tussen 20° en 21°)

(7)
[21]

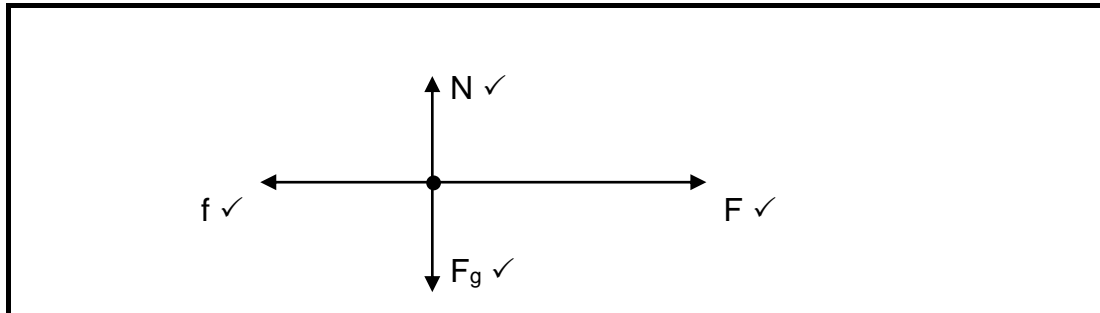
QUESTION/VRAAG 4

4.1 Frictional force is defined as the force that opposes the motion of an object. ✓✓

Wrywingskrag word gedefinieer as die krag wat die beweging van 'n voorwerp teenwerk. ✓✓

(2)

4.2



(4)

4.3 $N = mg$

$$N = (100)(9,8)$$

$$N = 980 \text{ N } ✓$$

$$f_k = \mu_k N ✓$$

$$f_k = (0,2) (980) ✓$$

$$f_k = 196 \text{ N } ✓$$

(4)

4.4 1 200 N ✓✓

(2)

4.5 0 N **OR/OF** (0) **OR/OF** Zero ✓

(1)

4.6 4.6.1 Decreases / *Verminder* ✓

(1)

4.6.2 Increases / *Vermeerder* ✓

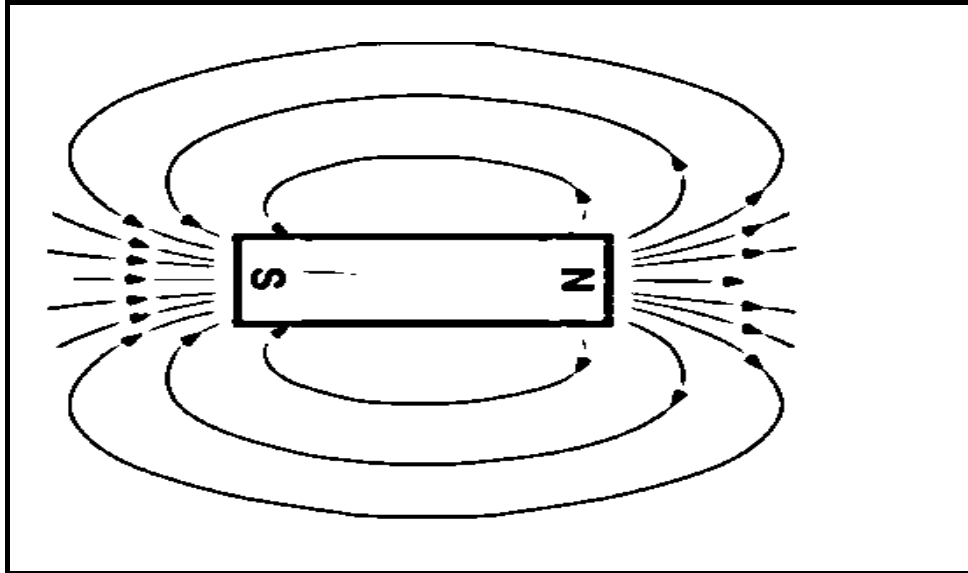
(1)

[15]

QUESTION/VRAAG 5

- 5.1 5.1.1 Magnetic field is defined as the region in space where a magnetic material experiences a magnetic force. ✓✓
’n Magneetveld word gedefinieer as die gebied in die ruimte waar magnetiese materiaal ’n magneetkrag sal ervaar. ✓✓ (2)

5.1.2



Direction / Rigting – ✓

Shape / Vorm – ✓

No crossing of lines and lines are closer at the poles.

Lyne kruis nie en is nader by die pole ✓

(3)

- 5.2 5.2.1 South pole / Suidpool ✓ (1)

5.2.2 North pole / Noordpool ✓ (1)

5.2.3 Attract / Aantrek ✓

Unlike poles attract each other /

Teenoorgestelde pole trek mekaar aan ✓ (2)

- 5.3 5.3.1 A **geomagnetic storm** is a temporary disturbance of the Earth’s magnetosphere caused by a solar wind magnetic field that interacts with the Earth’s magnetic field.

*’n **Geomagnetiese storm** is ’n tydelike ontwrigting van die Aarde se magneetveld wat voorkom wanneer daar ’n energieuitruiling van die sonwind in die ruimte-omgewing om die aarde plaasvind. ✓✓* (2)

5.3.2 Disruption in electrical system / Versteuring van ’n elektriese sisteem

Communication failure / Kommunikasie onderbreking

Satellite hardware damage / Skade aan satelliet hardeware

Radiation hazards to human / Bestralingsgevaar vir mense

(✓✓ Any two / Enige twee)

(2)

[13]

QUESTION/VRAAG 6

- 6.1 6.1.1 Electrostatic force of attraction or repulsion between two point charges is directly proportional to the product of the charges and inversely proportional to the square of the distance between them. ✓✓

Die elektrostatische krag van aantrekking of afstoting tussen twee puntladings is direk eweredig aan die produk van die ladings en omgekeerd eweredig aan die kwadraat van die afstand tussen hulle.

(2)

$$\begin{aligned}
 6.1.2 \quad F &= \frac{kQ_2Q_3}{r^2} \quad \checkmark \\
 &= \frac{9 \times 10^9 \times 2 \times 10^{-6} \times 5 \times 10^{-6}}{(20 \times 10^{-2})^2} \quad \checkmark \\
 &= 2,25 \text{ N} \quad \checkmark
 \end{aligned}$$

(4)

- 6.2 6.2.1 The principle of conservation of charge states that the net charge of an isolated system remains constant during any physical process. ✓✓

Die beginsel van die behoud van lading stel dat die netto lading van 'n geïsoleerde sisteem konstant bly tydens enige fisiese proses. ✓✓

(2)

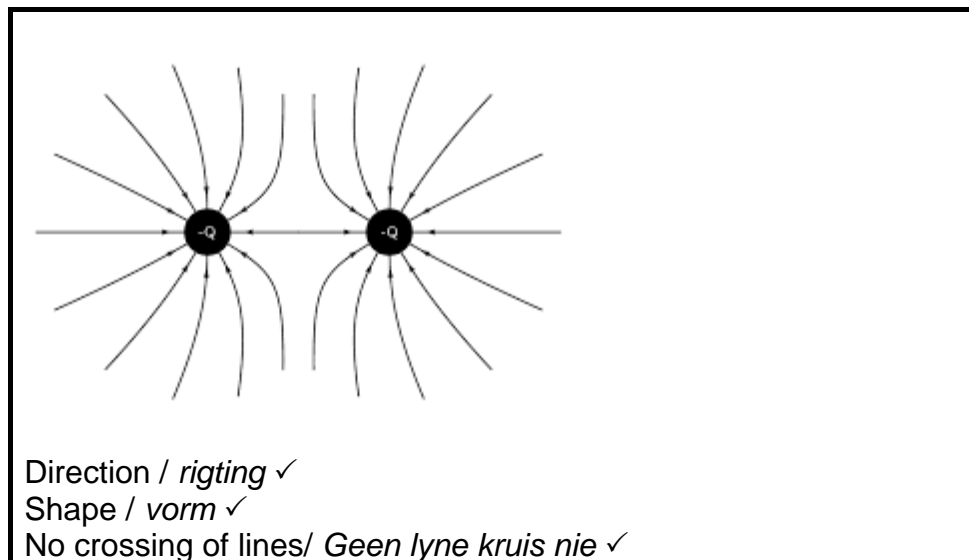
- 6.2.2 Electrons/ negative charge
Elektrone / negatiewe lading ✓✓

(2)

- 6.2.3 New charge on P or Q = $\frac{2 \times 10^{-6} + (-5 \times 10^{-6})}{2}$ ✓✓
(Nuwe lading op P of Q) = - 1,5 x 10⁻⁶ C ✓

(3)

- 6.2.4



(3)

[16]

QUESTION/VRAAG 7

- 7.1 A region in space in which an electric charge experiences a force. ✓✓
'n Gebied in die ruimte waar 'n elektriese lading 'n krag ondervind. ✓✓ (2)
- 7.2 $E = \frac{V}{d}$ ✓
 $E = \frac{50}{0.05}$ ✓
 $E = 1\,000 \text{ V}\cdot\text{m}^{-1}$ ✓ (3)
- 7.3 7.3.1 Towards plate Y / *Na plaat Y* ✓ (1)
 7.3.2 $1 \times 10^{-6} \text{ C}$ ✓ (1)
 7.3.3 $F = Eq$ ✓
 $F = (1000)(1 \times 10^{-6})$ ✓
 $F = 10^{-3} \text{ N}$ ✓ (3)
- 7.4 Inkjet printer / *Inkspuitdrukker*
 Photocopier / *Fotokopieerder*
 Spray painting / *Spuitverf*
 Defibrillator / *Defibrillator*
 Industrial chimneys / *Industriële skoorstene*
 (Any TWO/Enige TWEE ✓✓) (2)

[12]**QUESTION/VRAAG 8**

- 8.1 Emf is defined as the potential difference across a cell when the circuit is open. ✓✓
Emk word gedefinieer as die potensiaalverskil oor 'n sel indien die stroombaan oop is. (2)
- 8.2 8.2.1 $V_1 = IR_1$ ✓
 $V_1 = (1,5)(8)$ ✓
 $V_1 = 12 \text{ V}$ ✓ (3)
- 8.2.2 $V = IR$ ✓
 $(18 - 12) = 1,5 (R)$ ✓
 $R = 4 \Omega$ ✓ (4)
- 8.2.3 0 A OR/OF (0) OR/OF Zero ✓✓ (2)
- 8.3 $\frac{1}{R_{//}} = \frac{1}{R_1} + \frac{1}{R_2}$ ✓
 $\frac{1}{R_{//}} = \frac{1}{8} + \frac{1}{24}$ ✓
 $R_{//} = 6 \Omega$ ✓ (3)

[14]

QUESTION/VRAAG 9

- 9.1 9.1.1 a) Thickness of the conductor / *Dikte van die geleier* ✓
 b) Temperature / *Temperatuur* ✓
 c) Length of the conductor / *Lengte van die geleier* ✓
 d) Type of material / *Tipe materiaal* ✓ (4)
- 9.1.2 Ohm's law states that: The potential difference across a conductor is directly proportional to the current that flows through it when temperature remains constant. ✓✓
Ohm se wet: Die potensiaalverskil oor 'n geleier is direk eweredig aan die stroom wat deur dit vloei indien die temperatuur konstant bly. (2)
- 9.1.3 (a) Potential difference / *Potensiaalverskil* ✓ (1)
 (b) Current / *Stroom* ✓ (1)
- 9.1.4 $m = \frac{0.2-0.1}{2-1}$ ✓
 $= 0,1$ ✓
 $R = \frac{1}{m}$
 $= \frac{1}{0.1}$ ✓
 $= 10 \Omega$ ✓ (4)
- 9.2 Ohmic conductor: A conductor that obeys Ohm's law is called an ohmic conductor. ✓✓
 Non-ohmic conductor: A conductor that does not obey Ohm's law ✓✓
Ohmiese geleier: 'n Geleier wat Ohm se wet gehoorsaam ✓✓
Nie-Ohmiese geleier: 'n Geleier wat nie Ohm se wet gehoorsaam nie ✓✓ (4)

[16]**TOTAL/TOTAAL: 150**