



Province of the  
**EASTERN CAPE**  
EDUCATION

**NATIONAL  
SENIOR CERTIFICATE /  
NASIONALE SENIOR  
SERTIFIKAAT**

**GRADE/GRAAD 10**

**NOVEMBER 2018**

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

**MARKS/PUNTE: 150**

---

This marking guideline consists of 7 pages./  
*Hierdie nasienrglyn bestaan uit 7 bladsye.*

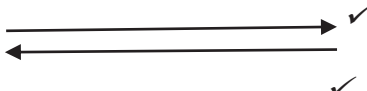
---


**QUESTION/VRAAG 1**

- 1.1 D ✓✓  
 1.2 D ✓✓  
 1.3 A ✓✓  
 1.4 A ✓✓  
 1.5 C ✓✓  
 1.6 B ✓✓  
 1.7 D ✓✓  
 1.8 C ✓✓  
 1.9 C ✓✓  
 1.10 A ✓✓

(10 x 2) [20]

**QUESTION/VRAAG 2**

- 2.1 Scalar is a quantity that has magnitude only ✓✓  
*Skalaar is 'n hoeveelheid wat slegs grootte het.* ✓✓  
 Vector is a quantity with both magnitude and direction ✓✓  
*Vektor is 'n hoeveelheid met beide grootte en rigting.* ✓✓ (4)
- 2.2 2.2.1 2,23 ✓✓ (kg) (2)  
 2.2.2 2 900 ✓✓ (m) (2)  
 2.2.3  $2,23 \times 10^3$  ✓✓ (2)
- 2.3 Shortest distance between two points in a particular direction **OR**  
 Straight line distance from the starting point to the finishing point with direction ✓✓  
*Kortste afstand tussen twee punte in 'n spesifieke rigting **OF***  
*Die reguitlyn tussen die beginpunt en eindpunt met rigting* ✓✓ (2)
- 2.4 2.4.1 2,9 km ✓ (or 2 900 m) (1)  
 2.4.2 2 km ✓ (or 2 000 m) to the RIGHT / na REGS ✓ (2)
- 2.5  $v = \text{displacement/time}$   $v = \text{verplasing/tyd}$  ✓  
 $= 2\,000 \checkmark / 1\,800 \checkmark = 1,11 \text{ m}\cdot\text{s}^{-1}$  ✓ (4)
- 2.6   
 Resultant displacement/Resultante verplasing = 0 N ✓ (3)

- 2.7.1  No / Nee ✓  
 There are equal changes in displacement in equal time intervals ✓  
 Therefore velocity is constant ✓  
 Daar is gelyke veranderinge in verplasing in gelyke tydintervalle ✓  
 Dus is die snelheid constant ✓ (3)

- 2.7.2  $T = 1/F = 1/50$  ✓ = 0,02s ✓  
 Time/tyd =  $5 \times 0,02$  ✓ = 0,1 s ✓ (4)

- 2.7.3  $v = \text{displacement} / \text{time} = 5$  ✓  $\times (20/100)$  ✓ / 0,1 ✓ =  $2 \text{ m}\cdot\text{s}^{-1}$  ✓  
 $v = \text{verplasing} / \text{tyd} = 5$  ✓  $\times (20/100)$  ✓ / 0,1 ✓ =  $2 \text{ m}\cdot\text{s}^{-1}$  ✓

OR

$$v = \frac{\text{Displacement} / \text{Verplasing}}{\text{Time} / \text{Tyd}} \quad \checkmark$$

$$= \frac{20 \text{ cm}}{0,1} \quad \checkmark \checkmark$$

$$= \frac{0,2 \text{ m}}{0,1} \quad \checkmark$$

$$= 2 \text{ m}\cdot\text{s}^{-1} \quad \checkmark$$

(4)  
[33]**QUESTION/VRAAG 3**

- 3.1 Single force which can produce the same effect as two or more forces ✓✓  
 'n Enkel krag wat dieselfde effek het as twee of meer kragte ✓✓ (2)
- 3.2 3.2.1  $F_1$  Normal/Normaal ✓ (1)
- 3.2.2  $F_2$  Applied force/Toegepaste krag ✓ (1)
- 3.2.3  $F_3$  Weight or Force of gravity/Gewig of Swaartekrag ✓ (1)
- 3.2.4  $F_4$  Friction/Wrywing ✓ (1)
- 3.3 Weight/Gewig ✓ or/of Force of gravity/Swaartekrag ✓ (1)
- 3.4  $F_g = mg$  ✓ =  $60 \times 9,8$  ✓ = 588 N ✓ (3)
- 3.5 Take right as positive/Neem regs as positief  
 $F_{\text{resultant}} = 50 + (-15) = 35 \text{ N}$  ✓✓ to the right/na regs ✓ (3)
- OR/OF**
- Take left as positive/Neem links as positief  
 $F_{\text{resultant}} = 15 + (-50) = -35 \text{ N} = 35 \text{ N}$  ✓✓ to the right/na regs ✓

- 3.6 3.6.1  $F_{\text{resultant}} = 0 \text{ N}$  ✓ (1)
- 3.6.2 Equilibrant / *Ekwilibrant* ✓ (1)
- 3.6.3  $F = 35 \text{ N}$  ✓ to the LEFT / *na LINKS* ✓ (2)

**[17]****QUESTION/VRAAG 4**

- 4.1 4.1.1 Moment ✓ (of a force / *van 'n krag*) / *Wringkrag* (1)
- 4.1.2 Cantilever / *Cantilever* ✓ (1)
- 4.1.3 Mechanical advantage / *Meganiese voordeel* ✓ (1)

- 4.2 4.2.1 Sum of moments *clockwise* / *Som van momente* *kloksgewys*  
 $= F_1 \times d_1 + F_2 \times d_2$  ✓  
 $= 3\,000 \times 2 + 4\,000 \times 4$  ✓  
 $= 22\,000 \text{ N.m}$  ✓ or (22 kN) (4)

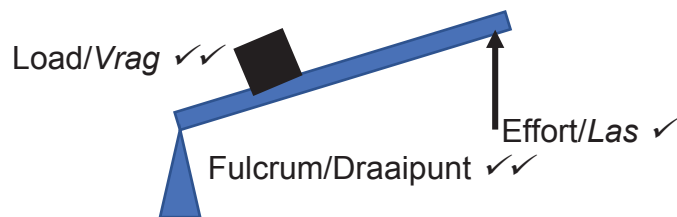
- 4.2.2  $M_{\text{ACW}} = M_{\text{CW}}$  ✓ (Law of moments / *Wet van momente*)  
 $R_B \times 6 = 22\,000$  ✓  
 $R_B = 3\,670 \text{ N}$
- $R_A + R_B = F_1 + F_2$  ✓ (Beam is in equilibrium / *Balk is in ewewig*)

$$R_A + 3\,670 = 3\,000 + 4\,000$$

$$R_A = 3\,330 \text{ N}$$

(6)

4.3



(6)

- 4.4 4.4.1 Class ONE / *Klas EEN* ✓  
 Load is between effort and fulcrum / *Vrag is tussen las en fulkrum* ✓ (2)

4.4.2  $F_L / F_E = d_E / d_L$  ✓

$$200 / 50 = (20 / 100) \times d_L$$

$$d_L = 0,05 \text{ m}$$

(4)

**[25]**

**QUESTION/VRAAG 5**

- 5.1.1 Energy a body has due to its position above the ground. ✓✓ (2)  
*Energie van 'n liggaam as gevolg van sy posisie bokant die grond* ✓✓
- 5.1.2 Sum of kinetic energy and potential energy ✓✓ (2)  
*Som van die kinetiese en potensiële energie* ✓✓
- 5.2.1  $E_{k \text{ at P}} = \frac{1}{2} mv^2$  ✓  
 $= \frac{1}{2} \times 60 \times 4^2$  ✓ (3)  
 $= 480 \text{ J}$  ✓
- 5.2.2  $U_{\text{at Q}} = mgh$  ✓  
 $= 60 \times 9,8 \times 3$  ✓ (3)  
 $= 1764 \text{ J}$  ✓
- 5.3  $U_{\text{at P}} = mgh$   
 $2469 \text{ ✓} = 60 \times 9,8 \times h$  ✓  
 $4,2 \text{ m ✓} = h$  Accept/Aanvaar 4,199 m (3)
- 5.4  $E_{k \text{ at Q}} = \frac{1}{2} mv^2$   
 $705,6 \text{ ✓} = \frac{1}{2} (60) \text{ ✓} v^2$   
 $v = 4,85 \text{ m.s}^{-1}$  ✓ (3)

**[16]****QUESTION/VRAAG 6**

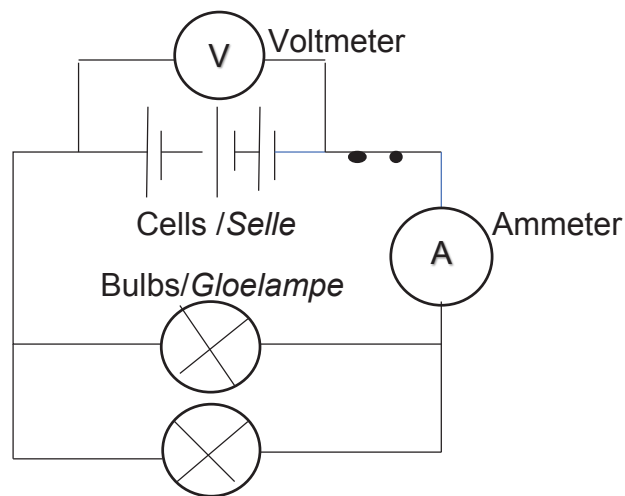
- 6.1 REMOVED /VERWYDER ✓ (1)
- 6.2  $n_e = \Delta Q/e$  ✓  
 $= 6 \times 10^{-6} / 1,6 \times 10^{-19}$  ✓  
 $= 3,75 \times 10^{-19} \text{ ✓} e^-$  (3)
- 6.3 To prevent charge from leaking ✓✓ (2)  
*Om te verhoed dat lading uitlek* ✓✓
- 6.4 6.4.1 Total charge of an isolated system remains constant ✓✓ (2)  
*Totale lading van 'n geïsoleerde system bly constant.* ✓✓
- 6.4.2 From R to P / Van R na P ✓ (1)
- 6.4.3  $Q_{\text{total before}} / Q_{\text{totaal voor}} = (+6 \times 10^{-6} + 0)$   
 $Q_{\text{total after}} = Q_{\text{total before}} / Q_{\text{totaal na}} = Q_{\text{totaal voor}}$   
 $Q_R = +6 \times 10^{-6} / 2 \text{ ✓✓} = +3 \times 10^{-6} \text{ C ✓}$  (3)

**[12]**

**QUESTION/VRAAG 7**

- 7.1 Rate of flow of charge/ *Tempo van vloei van lading* ✓✓ (2)
- 7.2 7.2.1 CIRCUIT/STROOMBAAN 2 ✓ (1)
- 7.2.2 CIRCUIT/STROOMBAAN 1 ✓ (1)
- 7.3 **Y to/na X** ✓ (1)
- 7.4 7.4.1 EMF = 12 V ✓ (1)
- 7.4.2  $R_p = R_1 R_2 / R_1 + R_2$  ✓ =  $12 \times 12 / (12 + 12)$  ✓ =  $6 \Omega$  ✓ (3)

7.5



<b>Marking criteria/Merk kriteria</b>
Three cells / <i>Drie selle</i> ✓
Voltmeter ✓
Ammeter ✓
Bulbs in parallel/ <i>Gloeilampe in parallel</i> ✓
Switch/ <i>Skakelaar</i> ✓

(5)  
[14]

**QUESTION/VRAAG 8**

- 8.1 8.1.1 Opposition to flow of electric current ✓✓ (2)  
*Opposisie teen die vloei van elektriese stroom ✓✓*
- 8.1.2 Length of conductor/*Lengte van die geleier* ✓ (1)
- 8.1.3 Temperature/*Temperatuur* ✓  
 Thickness (Cross sectional area)/*Dikte (Deursnit-area)* ✓ (3)  
 Type of conductor/*Tipe geleier* ✓
- 8.2 8.2.1 The longer the conductor the higher the resistance OR  
 The shorter the conductor the lower the resistance OR  
 Resistance is directly proportional to the length of the  
 conductor ✓✓ (2)  
*Hoe langer die geleier, hoe hoër is die weerstand **OF***  
*Hoe korter die geleier, hoe laer is die weerstand **OF***  
*Weerstand is direk eweredig aan die lengte van die geleier ✓✓*
- 8.2.2  $9 \sqrt{\sqrt{\Omega}}$  (2)
- 8.2.3 Gradient/Gradiënt =  $(18 - 9) \sqrt{\sqrt{7 - 3}} = 2,25 \sqrt{\sqrt{\quad}}$  (3)  
**[13]**

**TOTAL/TOTAAL: 150**