Downloaded from SEE academy: www.seeacademy.co.za

Province of the EASTERN CAPE EDUCATION

# NATIONAL SENIOR CERTIFICATE/ *NASIONALE SENIOR SERTIFIKAAT*

## GRADE/*GRAAD 11*

## NOVEMBER 2025

## PHYSICAL SCIENCES P1/ *FISIESE WETENSKAPPE V1*
## MARKING GUIDELINE/*NASIENRIGLYN*

**MARKS/*PUNTE*:** **150**

SEE ACADEMY

This marking guideline consists of 12 pages./
*Hierdie nasienriglyn bestaan uit 12 bladsye.*

Downloaded from SEE academy: www.seeacademy.co.za


**QUESTION/*VRAAG 1***

1.1 A ✓✓ (2)

1.2 C ✓✓ (2)

1.3 B ✓✓ (2)

1.4 C ✓✓ (2)

1.5 D ✓✓ (2)

1.6 D ✓✓ (2)

1.7 B ✓✓ (2)

1.8 C ✓✓ (2)

1.9 C ✓✓ (2)

1.10 D ✓✓ (2)

**[20]**

SEE ACADEMY

Downloaded from SEE academy: www.seeacademy.co.za



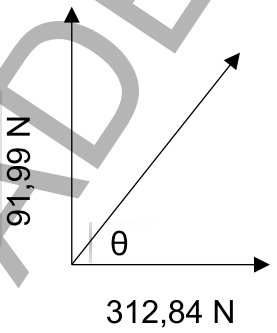
**QUESTION/*VRAAG 2***

2.1 A physical quantity having both magnitude and direction. ✓✓
*'n Fisiese hoeveelheid met beide grootte en rigting.* (2)

2.2 2.2.1

| ***For the x-components/ Vir die x-komponente*** | ***For the y-components / Vir die y-komponente*** |
|---|---|
| **$F_1$**<br>$F_x = 700\cos60^o$ ✓<br>$F_x = 700\sin30^o$<br>= 350 N right / *regs*<br>**$F_2$**<br>$F_x = 800\cos40^o$ ✓<br>$F_x = 800\sin50^o$<br>= 612,84 N right / *regs*<br>$F_3 = F_x = 650$ N left / *links*<br>$F_x = 350 + 612,84 - 650 = 312,84$ N right /*regs* ✓ | **$F_1$**<br>$F_y = 700\sin60^o$ ✓<br>$F_y = 700\cos30^o$<br>= 606,22 N upward/*opwaarts*<br>**$F_2$**<br>$F_y = 800\sin40^o$ ✓<br>$F_y = 800\cos50^o$<br>= 514,23 N downward/*afwaarts*<br>$F_3 = F_y = 0$ N<br>$F_y = 606,22 - 514,23 = 91,99$ N upward/ *opwaarts* ✓ |

$F_{net}^2 = F_y^2 + F_x^2$
$F_{net}^2 = (312,84)^2 + (91,99)^2$
$F_{net} = 326,08$ N ✓
$\tan\theta = \frac{91,99}{312,84}$ ✓
$\theta = 16,39°$
Direction / *rigting* = 73,7° ✓




(9)

2.2.2 W = mg
W = 25 x 9,8 ✓
W = 245 N ✓ (2)

2.3 The resultant force is not equal to zero. ✓✓
*Die resulterende krag is nie gelyk aan nul nie.* (2)
**[15]**

SEE ACADEMY

Downloaded from SEE academy: www.seeacademy.co.za


**QUESTION/*VRAAG 3***

3.1 The magnitude of the electrostatic force exerted by one point charge (Q1) on another point charge (Q2) is directly proportional to the product of the magnitudes of the charges ✓and inversely proportional to the square of the distance (r) between them. ✓
*Wanneer 'n resulterende/netto krag op 'n voorwerp inwerk, sal die voorwerp in die rigting van die krag versnel teen 'n versnelling direk eweredig aan die krag en omgekeerd eweredig aan die massa (van die voorwerp).*

**OR/*OF***

This acceleration is directly proportional to the net force ✓ and inversely proportional to the mass. ✓
*Die versnelling is direk eweredig aan die netto krag en omgekeerd eweredig aan die massa.* (2)

3.2 3.2.1 **Truck / *Vragmotor***: N = mg = (4 500)(9,8) = 44 100 N
$f_k = \mu_k N$ ✓
8 820 = μ (44 100) ✓
$\mu_k$ = 0,2 ✓ (3)

3.2.2 **POSITIVE MARKING FROM QUESTION 3.3.1 / *POSITIEWE NASIEN VANAF VRAAG 3.3.1***
**Bakkie**: N = mg = (1 250)(9,8) = 12 250 N ✓
$f_k = \mu_k N$
$f_k$ = (0,2)(12 250) ✓
$f_k$ = 2 450 N ✓ (3)

3.2.3

| **OPTION 1 / *OPSIE 1*** | **OPTION 2 / *OPSIE 2*** |
|---|---|
| $F_{net}$ = F - $f_k$ – T ✓ | $F_{net}$ = T - $f_k$ ✓ |
| 0 = 11 270 + (- 8 820) - T ✓ | 0 = T – 2 450 ✓ |
| T = 2 450 N ✓ | T = 2 450 N ✓ |

(3)
**[11]**

SEE ACADEMY

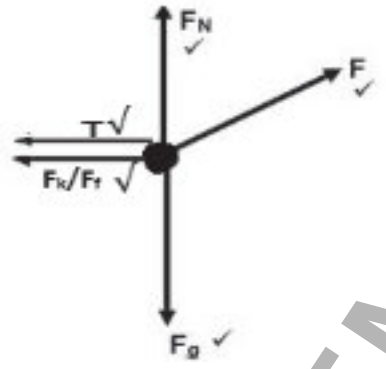
Downloaded from SEE academy: www.seeacademy.co.za



**QUESTION/*VRAAG 4***

4.1 The force that opposes the motion of a moving object relative to a surface. ✓✓
*Die krag wat die beweging van 'n bewegende voorwerp relatief tot 'n oppervlak teenwerk.* (2)

4.2




| | |
|---|---|
| $f_k$ | $F_f$, frictional force / *Wrywingskrag* |
| T | $F_T$, tension, tension force / *Spanning / spanningskrag* |
| N | $F_N$, normal force / *normaalkrag* |
| F | $F_A$, $F_{applied}$ /*toegepas*, $F_{App}$ |
| W | $F_g$, gravitational force / *gravitasiekrag* |

**NOTE / *LET WEL*:**
If arrows do not touch the dot deduct 1 mark./ *As pyle nie die kolletjie raak nie, trek 1 punt af.*
Any additional force(s), deduct 1 mark./ *Enige addisionele krag(te), trek 1 punt af.* (5)

4.3 4.3.1 $N = F_g - F\sin\theta$ ✓
$N = 10 \times 9{,}8 - 50\sin30°$ ✓
$N = 73$ N ✓ (3)

4.3.2 **POSITIVE MARKING FROM QUESTION 4.3.1 / *POSITIEWE NASIEN VANAF VRAAG 4.3.1***

$F_{net} = ma$
$F_{net} = T - f_k$
$F_{net} = F\cos\theta - T - f_k$ Any one / *Enige een* ✓
$F_{net} = F_x - T - f_k$
$T - 9$ ✓ $= 5a$ ..... 1 Any one / *Enige een* (10a or/*of* 5a) ✓
$[50\cos30°$ ✓$- T - (0{,}18 \times 73)$ ✓ ] ✓ $= 10a$ ..... 2
$a = 1{,}41$ m.s$^{-2}$ ✓ (7)

4.4 Increases. ✓ The magnitude of the vertical component of the applied force will decrease ✓ (as the weight will remain constant) and hence an increase in the magnitude of the normal force. ✓
*Toeneem. Die grootte van die vertikale komponent van die toegepaste krag sal afneem (soos die gewig konstant bly) en dus 'n toename in die grootte van die normaalkrag.* (3)

SEE ACADEMY

Downloaded from SEE academy: www.seeacademy.co.za


4.5 (According to Newton First law, the car will be moving at a constant velocity). When breaks are applied the seat of the child will continue in its state of constant velocity ✓ (in the direction of the windscreen which can be fatal), when the child is secured the belt will exert a net force in opposite direction ✓ that will accelerate the child back to the safety position in the child's seat. ✓
(Volgens Newton se eerste wet sal die motor teen 'n konstante snelheid beweeg). Wanneer remme toegepas word, sal die kind se sitplek in sy toestand van konstante snelheid bly (in die rigting van die voorruit wat noodlottig kan wees), wanneer die kind vasgemaak is, sal die gordel 'n netto krag in die teenoorgestelde rigting uitoefen wat die kind terug na die veiligheidsposisie in die kinderstoel sal versnel. (3)

**[23]**

SEE ACADEMY

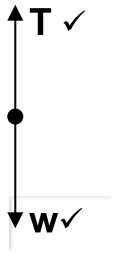
Downloaded from SEE academy: www.seeacademy.co.za



**QUESTION/*VRAAG 5***

5.1 A body will remain in its state of rest or motion at constant velocity unless a non-zero resultant/net force acts on it. ✓✓
*'n Liggaam sal in sy toestand van rus of beweging teen konstante snelheid behou, tensy 'n nie-nul resulterende/netto krag daarop inwerk.* (2)

5.2




(2)

5.3 5.3.1
$f_k = \mu_k N$
$f_k = \mu_k F_g \cos\theta$
$f_k = \mu_k mg\cos\theta$
Any one / *Enige een* ✓
$f_k = (0,25)(8)(9,8)\cos 20^o$ ✓
$= 18,42$ N ✓ (3)

5.3.2
$F_{net} = ma$
$F_{net} = F_g - T$
$F_{net} = T - F - f_k - F_{g//}$
Any one / *Enige een* ✓
$0 = T - 6 \times 9,8$ ✓
$T = 58,8$ N
$0 = [58,8 - F - 18,42 - 8 \times 9,8\sin 20^o$ ✓$]$ ✓
$F = 13,57$ N ✓ (5)

5.4 $v_f^2 = v_i^2 + 2a\Delta y$ ✓
$= 0^2 + 2(3,6)(2)$ ✓
$= 3,79$ m·s$^{-1}$ ✓ (3)
**[15]**

SEE ACADEMY

Downloaded from SEE academy: www.seeacademy.co.za


**QUESTION/*VRAAG 6***

6.1 Newton's third law ✓
When object A exerts a force on object B, object B SIMULTANEOUSLY exerts an oppositely directed force of equal magnitude on object A. ✓✓
*Newton se derde wet*
*Wanneer voorwerp A 'n krag op voorwerp B uitoefen, oefen voorwerp B GELYKTIGDIG 'n teenoorgestelde krag van gelyke grootte op voorwerp A uit.* (3)

6.2 $F = \frac{Gm_1m_2}{r^2}$ ✓

$250$ ✓ $= \frac{(6,67 \times 10^{-11})(5,98 \times 10^{24})(500)}{(d)^2}$ ✓

$d^2 = 7,98 \times 10^{14}$

$d = 2,82 \times 10^7$ m ✓

distance above earth surface / *afstand bo die aarde se oppervlakte*

$= 2,82 \times 10^7 - 6,38 \times 10^6 = 2,182 \times 10^7$ m ✓ (5)

**[8]**

SEE ACADEMY

Downloaded from SEE academy: www.seeacademy.co.za



**QUESTION/*VRAAG 7***

7.1. The electrostatic force of attraction or repulsion between two charges is directly proportional to the product of the charges ✓ and inversely proportional to the square of the distance between them. ✓
*Die elektrostatiese aantrekkings- of afstotingskrag tussen twee ladings is direk eweredig aan die produk van die ladings en omgekeerd eweredig aan die kwadraat van die afstand tussen hulle.* (2)

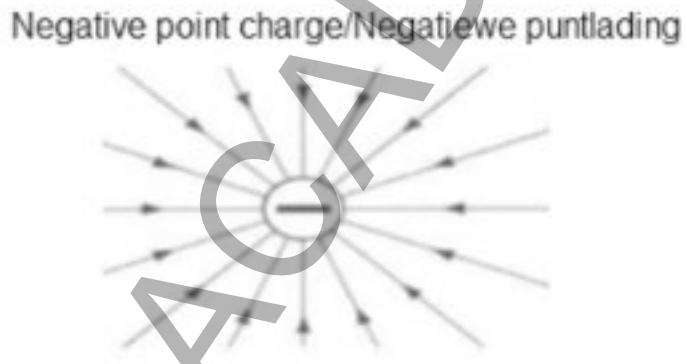
7.2

| | |
|---|---|
| $F = \frac{kQ_1Q_2}{d^2}$ ✓<br><br>$F_1 = \frac{(9 \times 10^9)(100 \times 10^{-6})^2}{(0,06)^2}$ ✓<br>$F_1 = 25\,000$ N right/ *regs* | $F_2 = \frac{(9 \times 10^9)(100 \times 10^{-6})^2}{(0,03)^2}$ ✓<br>$F_2 = 100\,000$ N right / *regs*<br><br>$F_{net} = F_A + F_B$<br>$F_{net} = 25\,000 + 100\,000$ ✓<br>$F_{net} = 125\,000$ N ✓ right / *regs* ✓ |

(6)

7.3 7.3.1 Electric field at a point is the electrostatic force experienced per unit positive charge placed at that point. ✓✓
*Die elektrieseveld by 'n punt is die elektrostatiese krag wat per eenheid positiewe lading wat by daardie punt geplaas word, ervaar word.* (2)

7.3.2




| CRITERIA FOR MARKING/ *NASIENKRITERIA* | |
|---|---|
| Correct field direction / *Korrekte veldrigting* | ✓ |
| Lines starting from sphere and not crossing each other / *Lyne begin vanaf die sfeer en kruis nie mekaar nie* | ✓ |

(2)

7.3.3 $E = \frac{kQ}{r^2}$ ✓

$E = \frac{(9 \cdot 10^9)(2 \cdot 10^{-6})}{(0,1)^2}$ ✓

$E = 1,8 \times 10^6$ $N \cdot C^{-1}$ left / *links* ✓ (3)

**[15]**

SEE ACADEMY

Downloaded from SEE academy: www.seeacademy.co.za


**QUESTION/*VRAAG 8***

8.1 North pole / *Noordpool* ✓✓ (2)

8.2 Towards Q / *Na* Q ✓✓ (2)

8.3 8.3.1 The magnitude of the induced emf across the end of a conductor is directly proportional to the rate of change in the magnetic flux linkage with the conductor. ✓✓

*Die grootte van die geïnduseerde emk oor die punt van 'n geleier is direk eweredig aan die tempo van verandering in die magnetiesevloed-koppeling in die geleier.* (2)

8.3.2 Pull the solenoid out of the magnetic field faster.
Increase the number of turns on the coil.
Increase the area of the coil.
Use a stronger magnetic field.
(Any TWO) ✓✓
*Trek die solenoïde vinniger uit die magneetveld.*
*Verhoog die aantal windings op die spoel.*
*Vergroot die oppervlakte van die spoel.*
*Gebruik 'n sterker magnetiese veld.*
(Enige TWEE) (2)

8.3.3 $\Phi = BA\cos\theta$ ✓
$= 0,6\ (0,08)\cos 0°$ ✓
$= 0,048$ Wb ✓ (3)

8.3.4 $\varepsilon = \frac{-N\Delta\Phi}{\Delta t}$ ✓
$\varepsilon = -\frac{350\ (0 - 0,048)}{0,25}$ ✓
$\varepsilon = 67,2$ V ✓ (3)
**[14]**

SEE ACADEMY

Downloaded from SEE academy: www.seeacademy.co.za



**QUESTION/*VRAAG 9***

9.1. Ohmic conductor. ✓ The graph is a straight line from the origin. ✓ The current is directly proportional to the potential difference across the conductor. ✓
*Ohmiese geleier. Die grafiek is 'n reguit lyn vanaf die oorsprong. Die stroom is direk eweredig aan die potensiaalverskil oor die geleier.* (3)

9.2 9.2.1 Current / *Stroom* ✓ (1)

9.2.2 Temperature / *Temperatuur* ✓
Length of conductor / Lengte van die geleier ✓
Thickness of conductor / *Dikte van geleier*
**Accept** Resistance / ***Aanvaar*** *Weerstand*
any TWO/ *enige TWEE* (2)

9.3 9.3.1 Gradient / *gradiënt* = $\frac{\triangle I}{\triangle V}$ ✓
Gradient / *gradiënt* = $\frac{0,6-0,2}{2,5-0,85}$ ✓
Gradient / *gradiënt* = 0,24 ✓ (3)

9.3.2 **POSITIVE MARKING FROM QUESTION 9.3.1 / *POSITIEWE NASIEN VANAF VRAAG 9.3.1***
$R = \frac{1}{0,24}$ ✓
R = 4,2 Ω
$P = I^2R$ ✓
$150 = 6^2R$ ✓
R = 4,2 Ω ✓
The conductor will be suitable. ✓ Resistance of conductor is equal to the resistance required. ✓
*Die geleier sal geskik wees. Die weerstand van die geleier is gelyk aan die weerstand wat benodig word.* (6)
**[15]**

SEE ACADEMY

Downloaded from SEE academy: www.seeacademy.co.za



**QUESTION/*VRAAG 10***

10.1 Emf / *Emk* ✓ **OR/*OF*** Electromotive force/*Elektromotoriese krag* (1)

10.2 $\frac{1}{R_p} = \frac{1}{R_1} + \frac{1}{R_2}$ ✓

$\frac{1}{RR} = \frac{1}{11} + \frac{1}{11+11}$ ✓

Rp = 7,37 Ω

Rext = 7,37 + 5 ✓ = 12,37 Ω

emf = I(R + r) ✓

12 = I(12,37 + 0,6) ✓

I = 0,93 A ✓ (6)

10.3

**OPTION/*OPSIE 1***

V = IR ✓

V = (0,93)(12,37) ✓

V = 11,50 V ✓

**Range / *Gebied* (11,44 – 11,50)**

**OPTION/*OPSIE 2***

V = IR ✓

V = (0,93)(0,6) ✓

$V_{int}$ = 0,558 V

V = 12 – 0,582

V = 11,44 V ✓ (3)

10.4 Increase / *Verhoog* ✓ (1)

10.5 Total resistance increases , ✓ the total current decreases ✓ so the lost volts decreases. Vext = ℰ – Vint ✓

*Die totale weerstand neem toe, die totale stroom neem af dus sal die verlore volt / spanning afneem. Vext = ℰ – Vint* (3)

**[14]**

**TOTAL/*TOTAAL:* 150**

SEE ACADEMY

Copyright reserved/*Kopiereg voorbehou*