education

Department:
Education
North West Provincial Government
REPUBLIC OF SOUTH AFRICA

PROVINCIAL ASSESSMENT/
PROVINSIALE ASSESSERING

GRADE/GRADE 11

TECHNICAL SCIENCES P1
TEGNIESE WETENSKAPPE V1

NOVEMBER 2024

MARKING GUIDELINES/*NASIENRIGLYNE*

MARKS/*PUNTE*: 150

These marking guidelines consists of 11 pages.
Hierdie nasienriglyne bestaan uit 11 bladsye.

QUESTION 1/*VRAAG 1*

1.1 B ✓✓ (2)

1.2 A ✓✓ (2)

1.3 D ✓✓ (2)

1.4 B ✓✓ (2)

1.5 D ✓✓ (2)

1.6 C ✓✓ (2)

1.7 C ✓✓ (2)

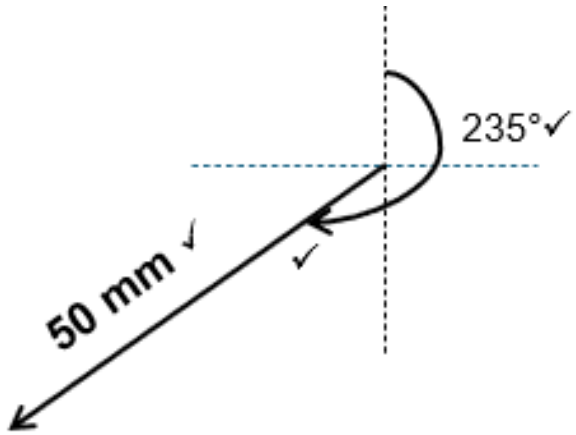
1.8 B ✓✓ (2)

1.9 A ✓✓ (2)

1.10 A ✓✓ (2)
[20]

QUESTION 2/*VRAAG 2*

2.1



MARKING CRITERIA:
- 1 mark for correct direction
- 1 mark for correct magnitude
- 1 mark for correct angle size

***NASIENKRITERIA**:*
- *1 punt vir korrekte rigting*
- *1 punt vir korrekte grootte*
- *1 punt vir korrekte hoek grootte*

(3)

2.2.1 Origin ✓ *Oorsprong/beginpunt* (1)

2.2.2 (-2✓; 2✓) (2)

2.2.3 (1✓; -2✓) (2)
[8]

QUESTION 3/*VRAAG 3*

3.1.1 Tension✓
Spanning/Spanningskrag (1)

3.1.2 Left✓
Links (1)

3.2.1

OPTION 1: ***Right as positive*** ***Na regs as positief***	**OPTION 2:** ***Left as positive*** ***Na links as positief***
$F_R = F_1 + F_2$ ✓ $F_R = (-80) + 50$ ✓ $F_R = 30$ N ✓ left ✓	$F_R = F_1 + F_2$ ✓ $F_R = (80) + (-50)$ ✓ $F_R = 30$ N ✓ left ✓

(4)

3.2.1 The single force/vector which can produce the same effect as two or more forces/vectors. ✓✓

OR

The single force/vector that has the same effect as two or more forces /forces acting together.

'n Enkele krag/vektor wat dieselfde effek het as die ander gesamentlik.

OF

'n Enkele krag/vektor wat dieselfde effek het as twee of meer kragte/vektore saam.

(2)

3.2.2 $\theta = 90° - 42°$✓
$= 48°$✓ (2)

3.2.3 **POSITIVE MARKING FROM QUESTION 3.2.2**
POSITIEWE NASIEN VANAF VRAAG 3.2.2
$F_x = F.\cos\theta$ ✓
200✓ = F.cos 48° ✓
F= 298,90 N ✓ (horizontally downwards) (4)

3.2.4 **POSITIVE MARKING FROM QUESTION 3.2.2**
POSITIEWE NASIEN VANAF VRAAG 3.2.2
$F_y = F\sin\theta$✓
$F_y = 298{,}90 \sin 48°$✓
$F_y = 222{,}13$ N ✓ (vertically upwards/*vertikaal opwaarts*) (3)
[17]

QUESTION 4/*VRAAG 4*

4.1 The force of attraction exerted by the earth on an object. ✓✓
Die gravitasiekrag wat deur die aarde op enige voorwerp uitgeoefen word. (2)

4.2 Normal force✓ (1)
Normaalkrag/Normale krag

4.3 0 N ✓ (1)

4.4 $w = mg$ ✓

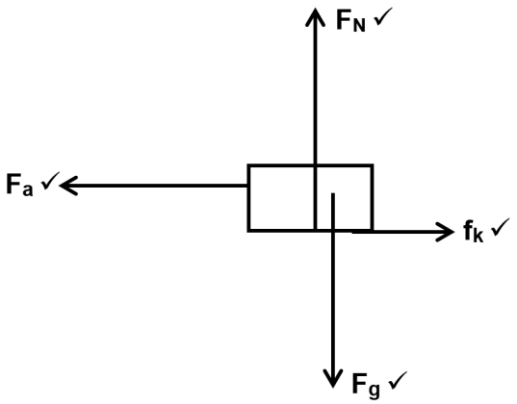
$60\,800$ ✓ $= m\,(9{,}8)$ ✓

$m = 6204,08$ kg✓

$\therefore m_{truck} = 6204,08 - 800$ ✓

$\therefore m_{truck} = 5\,404,08$ kg ✓ (6)

4.5



MARKING CRITERIA:
Penalise once (-1) if:
- No arrows/*geen pyle*
- Gaps between the line and the box/*spasie tussen lyne en boks*
- Dotted lines/*stippellyne*
- Additional force/*addisionele kragte*
- Free body diagram/ *vryeliggaamsdiagram*

Acceptable labels:
- F/1738 N/force applied/ *toegepaste krag*
- F_f /*f*/fricional force/ *wrywingskrag*
- w/gravitational force / *gravitasiekrag*
- N/Normal force/*Normale krag*

(4)

4.6 **POSITIVE MARKING FROM QUESTION 4.4**
POSITIEWE NASIEN VANAF VRAAG 4.4
$F_N/N = w = mg$ ✓

$F_N/N = (5\,404,08)(9{,}8)$ ✓

$F_N/N = 52\,959{,}98$ N ✓ (upwards/*opwaarts*) (3)

4.7 $F_R = -Fa + f_k$ ✓

$-2\,638$✓ $= -1738 + f_k$✓

$f_k =$ <u>900 N</u> (right/*regs)* ✓ (4)

4.8 **POSITIVE MARKING FROM QUESTION 4.6 and 4.7**
POSITIEWE NASIEN VANAF VRAAG 4.6 en 4.7

$f_k = \mu_k N$
$f_k = \mu_k F_N$ } Any one ✓

$900 = \mu_k (52\,959{,}98)$ ✓
$\mu_k = 0{,}02$✓ (3)

4.9 Smoothing/polishing the surface.✓
Lubricating the surface.
Reducing the contact between surfaces. (Any two)

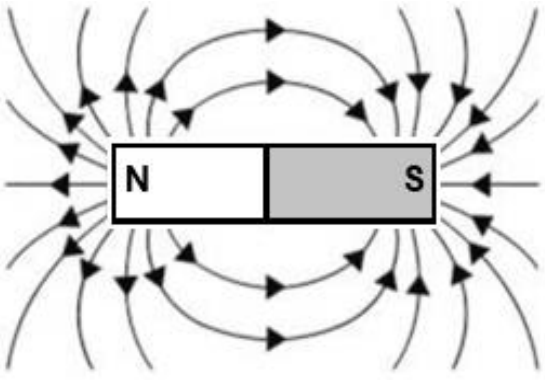
Glad maak/polering van oppervlakte.
Smeermiddel op oppervlakte.
Verminder kontak tussen oppervlaktes. *(Enige twee)* (2)
[26]

QUESTION 5/*VRAAG 5*

5.1 A region in space where another magnet or ferromagnetic material will experience a force✓✓

'n Gebied in die ruimte waarin magnetiese of ferromagnetiese stowwe 'n krag sal ondervind. (2)

5.2



MARKING CRITERIA:
- ONE mark for correct direction.
- ONE mark for continuous lines.

NASIENRIGLYNE:
- *EEN punt* vir *korrekte rigting.*
- EEN punt vir *aaneen-lopende lyne.*

(2)

5.3 Magnetic field lines never touch or cross one another. ✓
Magnetic field lines are continuous. ✓
Magnetic field lines are concentrated at the poles of the magnets. ✓
Magnetic field lines are imaginary.
Direction of magnetic field lines are from North to South. (Any three)

Magnetieseveldlyne raak of kruis mekaar nooit.
Magnetieseveldlyne is aaneenlopend.
Magnetieseveldlyne is nader aan mekaar by die magneetpole.
Magnetieseveldlyne is denkbeeldig.
Rigting van magnetieseveldlyne is van Noord na Suid. *(Enige drie)* (3)
[7]

QUESTION 6/*VRAAG 6*

6.1 The (electrostatic) force of attraction or repulsion between two point charges is directly proportional to the product of their charges✓ and inversely proportional to the square of the distance between the two charges.✓

Die elektrostatiese krag tussen twee puntladings is direk eweredig aan die produk van die ladings en omgekeerd eweredig aan die kwadraat van die afstand tussen die ladings. (2)

6.2 Electrostatic force versus square of the distance .✓✓
OR
The relationship between electrostatic force and the distance between two charges.

Elektrostatiese krag teenoor die vierkant van die afstand.
OF
Die verhouding tussen die elektrostatiese krag en die afstand tussen twee lading.s (2)

6.3 How will an increase/ change in distance affect the electrostatic force?✓✓

Hoe sal die verandering in afstand die elektrostatiese krag beïnvloed? (2)

6.4 When the distance increases, the electrostatic force decrease. ✓✓
OR
Electrostatic force is inversely proportional to the distance.

Wanneer die afstand verhoog, verminder die elektrostatiese krag.
OF
Elektrostatiese krag is omgekeerd eweredig aan die afstand. (2)

6.5.1 Electrostatic force ✓
Elektrostatiese krag (1)

6.5.2 Square of the distance ✓ (1)
Vierkant van die meter

6.6.1 A region of space in which an electric charge experiences a force.✓✓
'n Gebied/ruimte waar 'n gelaaide voorwerp 'n elektrostatiese krag ervaar. (2)

6.6.2 $E = \frac{V}{d}$ ✓

✓

$60 = \frac{12}{d}$ ✓

d= 0,2 m ✓ (4)

6.6.3 $E = \frac{F}{Q}$ ✓

$60 = \frac{F}{12 \times 10^{-6}}$ ✓

F = 7,2 ×10 $^{-4}$ N ✓ (3)

6.6.4

OPTION 1	**OPTION 2**
$E = \frac{F}{Q}$ $60 = \frac{F}{6 \times 10^{-6}}$ ✓ F = 3,6 ×10 $^{-4}$ N✓	F = 7,2 ×10 $^{-4}$ ×0,5✓ F = 3,6 ×10 $^{-4}$ N✓
OPTION 3 F = $\frac{^{-4}7,2 \times 10 - 4}{2}$ ✓ F = 3,6 ×10 $^{-4}$ N✓	

(2)
[21]

QUESTION 7/*VRAAG 7*

7.1 The current in a conductor is directly proportional to the potential difference across it✓, at constant temperature. ✓
Die stroomsterkte in 'n weerstand is direk eweredig aan die potensiaal verskil oor die resistor, by konstante temperature.

OR/*OF*

The voltage across a resistor, is directly proportional to the current through the resistor, provided that the temperature remains constant.
Die potensiaal verskil oor 'n resistor is direk eweredig aan die stroom wat deur die resistor vloei, mits die temperatuur konstant bly. (2)

7.2.1 $R = \frac{V}{I}$ ✓

$R = \frac{24}{0,9}$ ✓✓

$R_T = 26,67\Omega$✓ (4)

7.2.2 **POSITIVE MARKING FROM QUESTION 7.2.1**
POSITIEWE NASIEN VANAF VRAAG 7.2.1
$R_T = R_s + R_p$ ✓
✓ ✓
$26,67 = (12 + 6) + R_p$✓

$R_p = 8, 67\ \Omega$ ✓

$\frac{1}{R_P} = \frac{1}{R_1} + \frac{1}{R_2}$ ✓

$\frac{1}{8,67} = \frac{1}{10} + \frac{1}{R}$✓

$\frac{1}{R} = \frac{1}{8,67} - \frac{1}{10}.$

$\therefore R = 65,19\ \Omega$✓ (7)

POSITIVE MARKING FROM QUESTION 7.2.3
POSITIEWE NASIEN VANAF VRAAG 7.2.3

7.2.3 0,9 A ✓✓ (2)

7.2.4 $V = I\ R$

$V = (0,9)(12)$ ✓

$V = 10,8$ V✓ (2)

7.3.1 The resistance inside the cell/battery when current flows through it. ✓✓
Die weerstand binne-in die sel of battery wanneer daar stroom vloei. (2)

7.3.2 Potential difference✓
Potensiaalverskil (1)

7.3.3 emf is greater than potential difference when the switch is open. ✓✓
OR
No load connected to the circuit.

emk is groter as potensiaal verskil wanneer die skakelaar oop is.
OF
Geen stroom gekoppel is met die stroombaan. (2)
[22]

QUESTION 8/*VRAAG 8*

8.1.1 A succession of pulses.✓✓
'n Opeenvolging van pulse. (2)

8.1.2 The distance between two successive points in phase.✓✓
Die afstand tussen twee opeenvolgende punte wat in fase is. (2)

8.1.3 A wave in which the particles of the medium vibrate at right angles to the direction of propagation of the wave. ✓✓

'n Golf waarin die deeltjies van die medium reghoekig met die voortplantingsrigting vibreer. (2)

8.2.1 A/C/E ✓ (1)

8.2.2 B/D/F ✓ (1)

8.2.3 A & C ✓✓
C & E
B & D
D & F (Any one/*Enige een*) (2)

8.3.1 2 ✓✓ (2)

8.3.2 0,02 m ✓✓ (2)

8.4.1 $v = \frac{\lambda}{T}$✓

$v = \frac{80 \times 10^{-3}}{20}$✓✓

$v = 4 \times 10^{-3}$ m.s^{-1}✓ (4)

POSITIVE MARKING FROM QUESTION 8.4.2
POSITIEWE NASIEN VANAF VRAAG 8.4.2

8.4.2

OPTION 1	**OPTION 2** **Positive marking from Q 8.6**
$f = \frac{1}{T}$ ✓ $f = \frac{1}{20}$ ✓ f = 0, 05 Hz✓	$V = f\lambda$ ✓ $4 \times 10^{-3} = f\ (80 \times 10^{-3})$ ✓ f = 0, 05 Hz✓

(3)
[21]

QUESTION 9/*VRAAG 9*

9.1.1 Longitudinal (waves) ✓
Longitudinale golwe (1)

9.1.2

OPTION 1	**OPTION 2**
$V = \frac{\Delta \vec{x}}{\Delta t}$ ✓ ✓ $343 = \frac{200}{\Delta t}$ ✓ $\Delta t = 0,58$ s $\Delta t = 0,58 \times 2$ ✓ $\Delta t = 1,06$ s ✓	$V = \frac{\Delta \vec{x}}{\Delta t}$ ✓ ✓ ✓ $343 = \frac{200 \times 2}{\Delta t}$ ✓ $\Delta t = 1,06$ s ✓

(5)

9.2 To monitor volcanoes. ✓
To monitor earthquakes. ✓ (Any two relevant answers)

Monitor van vulkane.
Monitor van aardbewings. *(Enige twee relevante antwoorde)* (2)
[8]

TOTAL/*TOTAAL*: 150