education

Department:
Education
North West Provincial Government
REPUBLIC OF SOUTH AFRICA

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PROVINCIAL ASSESSMENT
PROVINSIALE ASSESSERING

GRADE/GRAAD 11

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PHYSICAL SCIENCES: PAPER 1
FISIESE WETENSKAPPE: VRAESTEL 1
19 MARCH/ MAART 2025
Marking Guidelines/ Merkriglyne

Marks/ Punte: 100

Time/ Tyd: 2 hours/ uur

These marking guidelines consists of 8 pages.
Hierdie merkriglyne bestaan uit 8 bladsye

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Please turn over/ Blaai asseblief om

QUESTION/ VRAAG 1

1.1 A ✓✓ (2)

1.2 B ✓✓ (2)

1.3 B ✓✓ (2)

1.4 B ✓✓ (2)

1.5 B ✓✓ (2)

1.6 D ✓✓ (2)
[12]

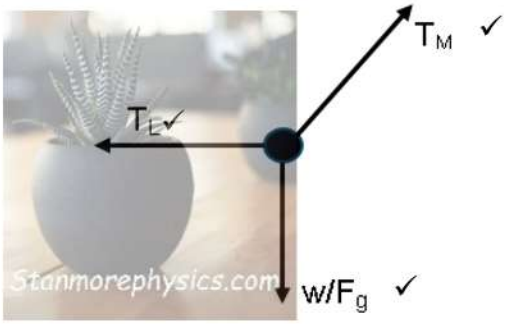


QUESTION/ VRAAG 2

2.1 Resultant is a single vector having the same effect as two or more vectors together / the vector sum of two or more vectors. ✓✓ (2)
Resultant is 'n enkele vektor wat dieselfde effek het as twee of meer vektore saam/ die som van twee of meer vektore. ✓✓

2.2 Zero/ Nul/ 0N ✓ (1)

2.3



(3)

2.4.1 $T_{yM} = 2540\sin 60$ ✓
$T_{yM} = 2199{,}70$ N ✓ (2)

2.4.2

OPTION/ OPSIE 1	OPTION/ OPSIE 2
$T_{yM} - mg = 0$ ✓ $2199{,}70 - m\times 9{,}8$ ✓ $= 0$ $m = 224{,}45$ kg ✓	$\sin 60 = \frac{m\times 9{,}8}{2199{,}70}$ ✓✓ $m = 224{,}45$ kg ✓

(3)

2.4.3 $\cos 60 = \frac{T_L}{2199{,}70}$ ✓
$T_L = 1270$ N ✓ (2)

[13]

QUESTION/ VRAAG 3

3.1 It is the force that opposes the motion of an object and which acts parallel to the surface.✓✓ (2)
Is die krag wat die beweging van 'n voorwerp teenstaan en werk parallel tot die oppervlak in. ✓✓

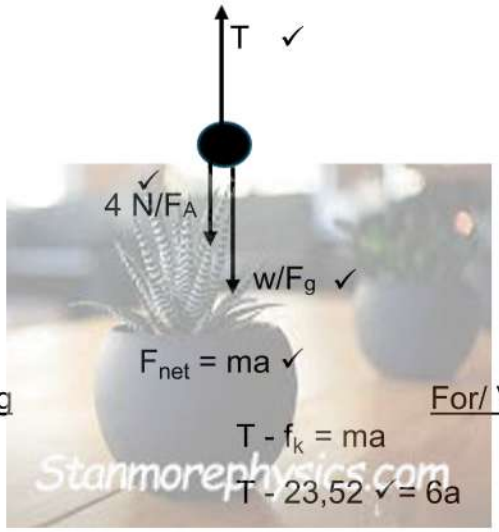
3.2 $N = mg\cos 36$
$N = 6 \times 9{,}8\cos 36$ ✓
$N = 47{,}5702$

$f_s^{max/maks} = \mu_s N$ ✓
$28{,}22 = \mu_s \times 47{,}5702$ ✓
$\mu_s = 0{,}59$ ✓ (4)

3.3 REMAINS THE SAME/ BLY DIESELFDE. ✓ (1)

3.4 The type of material in contact is the same/was not changed/coefficient of friction depends on the type of material in contact. ✓ (1)
Die tipe materiaal is dieselfde/ was nie verander nie/ wrywingskoëffisiënt is afhanklik van die tipe materiaal. ✓

3.5



(3)

3.6 $F_{net} = ma$ ✓

For/ Vir 4 kg	For/ Vir 6 kg
$mg + f_k - T = ma$	$T - f_k = ma$
$4 \times 9{,}8 + 4 - T$ ✓$= 4a$	$T - 23{,}52$ ✓$= 6a$
$T = 43{,}2 - 4a$	$T = 6a + 23{,}52$

$43{,}2 - 4a = 6a + 23{,}52$

$a = 1{,}968\ m\cdot s^{-2}$✓

$T = 43{,}2 - 4(1{,}968)$ ✓	$T = 6(1{,}968) + 23{,}52$ ✓
$T = 35{,}33$ N ✓	$T = 35{,}33$ N ✓

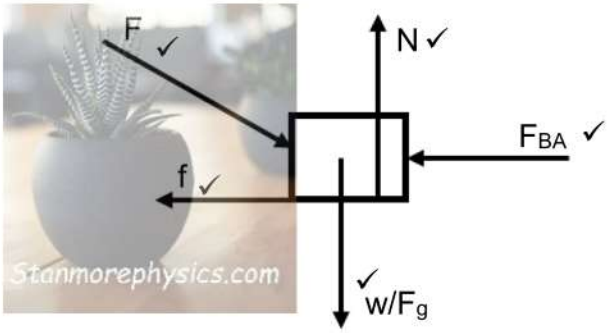
(6)
[17]

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QUESTION/ VRAAG 4

4.1 When a resultant/net force acts on an object, the object will accelerate in the direction of the force at an acceleration directly proportional to the force and inversely proportional to the mass of the object. ✓✓ (2)
Wanneer 'n resulante/ netto krag op 'n voorwerp inwerk, versnel die voorwerp in die rigting van die krag teen 'n versnelling wat direk eweredig is aan die krag en omgekeerd eweredig is aan die massa van die voorwerp. ✓✓

4.2



(5)

4.3 Newton's third law of motion/ Newton se derde bewegingswet. ✓ (1)

4.4.1 $N = mg + F\sin 40$

$\underline{303,8 = 23 \times 9,8 + F\sin 40}$ ✓✓

$F = 121,97$ N ✓ (3)

4.4.2

For object/ Vir voorwerp A	For object / Vir voorwerpB
$F_{net} = ma$ ✓	
$121,97\cos 40 - 45 - F_{BA} = 23a$ ✓	$F_{AB} - 45 = 31a$ ✓
$F_{BA} = 48,43 - 23a$	$F_{AB} = 31a - 45$

$48,43 - 23a = 31a - 45$ ✓

$a = 0,06\ m\cdot s^{-2}$ ✓ (5)

4.4.3

$F_{BA} = 48,43 - 23(0,06)$ ✓	$F_{AB} = 31(0,06) - 45$ ✓
$F_{BA} = 47,05$ N✓	$F_{AB} = 47,17$ N✓

(2)

4.5 N = mg
N = 31 × 9,8=303,8 N ✓
f_k = μN ✓
Both boxes experiences same magnitude of the Normal force. ✓
Boxes are identical and are placed on the same surface therefore will same coefficient of kinetic friction. ✓ (4)
Beide bokse ervaar dieselfde grootte Normaalkrag. ✓
Bokse is identies en is op dieselfde oppervlak, daarom dieselfde wrywingskoëffisiënt. ✓

[22]



QUESTION/ VRAAG 5

5.1 Weight is the gravitational force exerted by the Earth on an object✓. Mass as the amount of matter in a body. ✓ (2)
Gewig is die gravitasiekrag uitgeoefen deur die Aarde op 'n voorwerp. ✓ Massa is die hoeveelheid materie wat 'n voorwerp besit. ✓

5.2 Each particle in the universe attracts every other particle with a gravitational force that is directly proportional to the product of their masses and inversely proportional to the square of the distance between their centres. ✓✓ (2)
Elke liggaam in die ruimte trek elke ander liggaam aan met 'n gravitasiekrag wat direk eweredig is aan die produk van hul massas en omgekeerd eweredig is aan die kwadraat van die afstand tussen hulle middelpunte. ✓✓

5.3 $F_{SE} = \frac{Gm_S m_E}{d^2}$ ✓

$F_{SE} = \frac{6,67 \times 10^{-11} \times 1,999 \times 10^{30} \times 5,98 \times 10^{24}}{(1,50 \times 10^{11})^2}$ ✓ ✓

$F_{SE} = 3,53 \times 10^{22}$ N ✓ (4)

5.4 1.99×10^{20} N ✓ (1)

5.5 $F_{net} = 3,53 \times 10^{22} - 1.99 \times 10^{20}$ ✓

$F_{net} = 3,51 \times 10^{22}$ N towards the sun/ na die son ✓ (3)

[12]

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QUESTION/ VRAAG 6

6.1 The magnitude of the electrostatic force exerted by two point charges on each other is directly proportional to the product of the magnitudes of the charges and inversely proportional to the square of the distance between them. ✓✓ (2)
Die grootte van die elektrostatiese krag uitgeoefen deur twee puntladings op mekaar is direk eweredig aan die produk van die grootte van hul ladings en omgekeerd eweredig aan die kwadraat van die afstand tussen hulle. ✓✓

6.2



(2)

6.3

$$F_E = \frac{kQ_YQ_X}{d^2}$$ ✓

$w = mg$ ✓

$w = 0,04 \times 9,8$ ✓

$w = 0,392$ N

$$F_E = \frac{9 \times 10^9 \times 30 \times 10^{-9} \times 100 \times 10^{-9}}{d^2}$$ ✓

$$\frac{9 \times 10^9 \times 30 \times 10^{-9} \times 100 \times 10^{-9}}{d^2} = 0,392$$ ✓

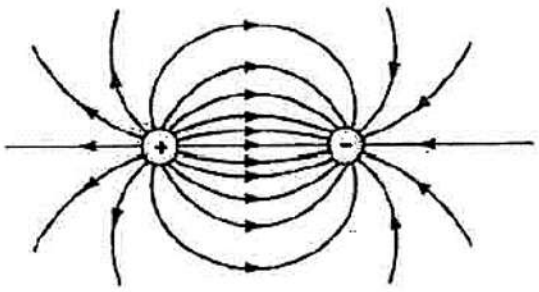
$d = 0,008$ m ✓

$d = 8$ mm ✓

(6)

6.4 It is the electrostatic force experienced per unit positive charge placed at that point. ✓✓ (2)
Dit is die elektrostatiese krag ervaar per eenheid positiewe lading by 'n punt. ✓✓

6.5



(3)

Criteria/ Kriteria	Marks/ Punte
Correct direction of the field lines./ Korrekte rigting van veldlyne	✓
Correct shape of the field lines between the charges and outside the charges./ Korrekte vorm van die veldlyne tussen die ladings en rondom die ladings	✓
No field lines crossing each other. Field lines must touch the charge but must not go inside the charge./ Geen veldlyne kruis mekaar.	✓

6.6 $F_{21}=\frac{kQ_2Q_1}{d_{21}^{\ 2}}$ ✓ $F_{31}=\frac{kQ_3Q_1}{d_{31}^{\ 2}}$

$F_{21}=\frac{9\times10^{9}\times2\times10^{-9}\times4\times10^{-9}}{(0,02)^2}$ ✓ $F_E=\frac{9\times10^{9}\times4\times10^{-9}\times4\times10^{-9}}{(0.04)^2}$ ✓

F_{21}=0,00018 N F_{21}=0,0009 N

F_{net} = 0,00018 + 0,0009 ✓

F_{net} = 0,00027 N ✓ Right/ Regs ✓ (6)

6.7 $E_{net}=\frac{F_{net}}{q}$ ✓

$E_{net}=\frac{0,00027}{4\times10^{-9}}$ ✓

E_{net} = 67500 N·C^{-1} Right/ Regs ✓ (3)

[24]