basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

SENIOR CERTIFICATE EXAMINATIONS/ NATIONAL SENIOR CERTIFICATE EXAMINATIONS
SENIORSERTIFIKAAT-EKSAMEN/ NASIONALE SENIORSERTIFIKAAT-EKSAMEN

TECHNICAL SCIENCES P1
TEGNIESE WETENSKAPPE V1

JUNE/JUNIE 2019

MARKING GUIDELINES/*NASIENRIGLYNE*

MARKS/*PUNTE*:150

These marking guidelines consist of 14 pages.
Hierdie nasienriglyne bestaan uit 14 bladsye.

QUESTION 1/*VRAAG* 1

1.1 A ✓✓ (2)

1.2 B ✓✓ (2)

1.3 C ✓✓ (2)

1.4 A ✓✓ (2)

1.5 C ✓✓ (2)

1.6 B ✓✓ (2)

1.7 C ✓✓ (2)

1.8 D ✓✓ (2)

1.9 D ✓✓ (2)

1.10 A ✓✓ (2)

[20]

QUESTION 2/*VRAAG* 2

2.1.1 An object continues in a state of rest or uniform velocity✓(moving with constant velocity) unless it is acted upon by an unbalanced force /(net or resultant force)✓
'n Liggaam sal in sy toestand van rus of uniforme snelheid (beweeg teen konstante snelheid) volhard tensy 'n ongebalanseerde krag/(netto of resulterende krag) daarop inwerk.

OR/*OF*
An object will remain in its state of rest or continue moving with a constant velocity✓(in a straight line) unless it is acted upon by a resultant force/ unbalanced force.✓
'n Voorwerp sal in sy toestand van rus of uniforme snelheid in 'n reguitlyn teen konstante snelheid volhard tensy 'n resulterende krag/ ongebalanseerde krag daarop inwerk. (2)

2.1.2 Zero ✓
OR/*OF*
0 ($m.s^{-2}$) ✓ (1)

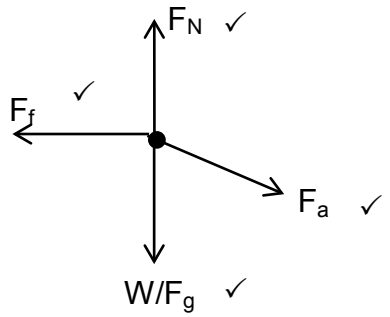
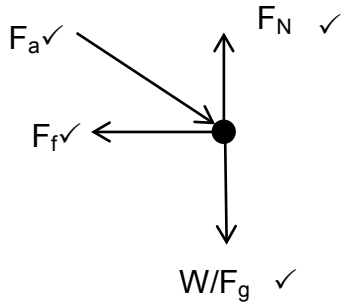
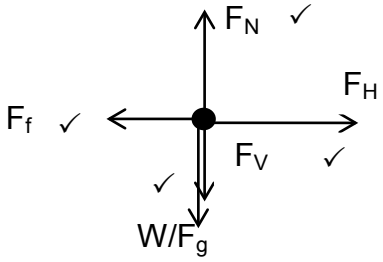
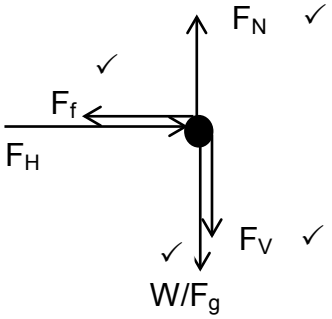
OPTION 1/*OPSIE* 1	**OPTION 2/*OPSIE* 2**
<u>*Choose east to be positive*</u> <u>*Kies oos as positief*</u> F_{net} = 0 (According to Newton's first law) F_{net} = ma $F_{net} = F_1 + F_2 + F_3$ ✓for any <u>0 = - 32 + (F_2) + 80</u>✓ F_2 = - 48 N ∴ F_2 = 48 N, (west) ✓	<u>*Choose east to be negative*</u> <u>*Kies oos as negatief*</u> F_{net} = 0 (According to Newton's first law) F_{net} = ma $F_{net} = F_1 + F_2 + F_3$ ✓for any <u>0 = 32 +F_2 + (- 80)</u>✓ ∴ F_2 = 48 N to the (west)✓

2.1.3

OPTION 3/*OPSIE* 3	**OPTION 4/*OPSIE* 4**
0✓ = - 32 + (F_2) + 80✓ F_2 = - 48 N ∴ F_2 = 48 N, (west)✓	0✓ = 32 +F_2 + (- 80)✓ ∴ F_2 = 48 N to the (west)✓
ACCEPT / **AANVAAR**: (Maximum :2 marks) $F_2 = F_3 - F_1$ F_2 = 80 – 32 ✓ F_2 = 48 N ✓	**ACCEPT**/ **AANVAAR**: (Maximum :2 marks) $F_3 - F_1$ = 80 – 32 ✓ = 48 N ✓

(3)

2.2.1

NOTES: One mark for each arrow with a correct label./*Een punt vir elke pyl met korrekte byskrif.* Penalise (once) for each: No arrows There is no dot Gap between the line and the dot Dotted lines are used. Additional force is included. A force diagram is given.	**ADDITIONAL LABELS:** N/F_N: Normal F_g/w: Force due to gravity/Weight F_f/f: friction F_v: Vertical component of F_a F_H: Horizontal component of F_a F_a: Applied force /140 N Accept the labels given in terms of magnitudes.
OPTION 1/OPSIE 1	**OPTION 2/OPSIE 2**
	**ACCEPT/ AANVAAR** 
OPTION 3/*OPSIE* 3	**OPTION 4/*OPSIE* 4**
NOTE: • A mark for both components of F_a.	**NOTE:** • A mark for both components of F_a.
	**Accept:** 

(4)

2.2.2

OPTION 2/*OPSIE* 2	**OPTION 1/*OPSIE* 1**
$F_N = F_g + F_V$ $= 25 \times 9,8 + 140 \sin 30^0$ ✓ $= 315$ N $F_K = \mu_k F_N$ ✓ $= \underline{0,12 \times 315}$ ✓ $= 37,80$ N ✓	$F_K = \mu_k F_N$ ✓ $= \mu_k(F_g + F_V)$ $= \underline{0,12}$ ✓$(25 \times 9,8 + 140 \sin 30^0)$ ✓ $= 37,80$ N ✓

(4)

2.2.3 Increases✓✓
Vermeeder (2)

2.2.4

POSITIVE MARKING FROM 2.2.2 **POSITIEWE NASIEN VANAF 2.2.2**	
OPTION 1/*OPSIE* 1	**OPTION 2/*OPSIE* 2**
$F_{net} = ma$ $F_{net} = F_H + F_f$ $F_H + F_f = ma$ ✓ for any $140 \cos 30^0 + (-37,8)$ ✓ $= 25a$ ✓ $121,24 - 37,8 = 25a$ $\therefore a = 3,34$ m.s^{-2} ✓	$F_{net} = F_H + F_f$ $= 140 \cos 30^0 + (-37,8)$ ✓ $= 83,44$ N $F_{net} = ma$ ✓ $83,44 = \underline{25a}$ ✓ $\therefore a = 3,34$ m.s^{-2} ✓

(4)

2.2.5 Decrease.✓✓
Verklein (2)
[22]

QUESTION/VRAAG 3

3.1.1 Impulse is the product of the net force (acting on an object) ✓and the time the net force (acts on the object).✓
Impuls is die produk van die resulterende krag (op die voorwerp) en die tydsduur dat die resulterende krag (op die voorwerp inwerk.)

Accept: Change in momentum
Aanvaar: Verandering in momentum (2)

3.1.2 Increases/*Vergroot*✓✓ (2)

3.1.3
- Decrease./Afneem ✓
- From Impulse-momentum theorem, it follows that net force exerted on an object is inversely proportional to the contact time. ✓✓(Accept mathematical expression: $F_{net} \propto \frac{1}{\Delta t}$)
  Volgens die Impuls-momentum stelling is die netto krag wat op 'n voorwerp inwerk omgekeerd eweredig aan die kontak tyd.(aanvaar wiskundige uitdrukking)

OR/*OF*

- From Impulse-momentum theorem, it follows that when contact time increases the net force decreases. ✓✓
  Volgens die Impuls-momentum stelling sal die netto krag verlaag indien die kontaktyd verhoog.

Criteriaformarking	**Marks**
Both correct variables mentioned	✓
Relationship correctly given	✓

(3)

3.1.4

OPTION 1/*OPSIE* 1	**OPTION 2/*OPSIE* 2**
(Towards the batsman is postive) $F_{net}\Delta t = \Delta p$ $F_{net}\Delta t = p_f - p_i$ $F_{net}\Delta t = m(v_f - v_i)$ ✓anyone $F_{net}(0,007)$✓ = 0,145(- 31,39 – 49,17)✓ F_{net} = - 1 668,74 N ∴ F_{net} = 1 668,74 N away from the batsman✓ **NOTE:** F_{net} must have magnitude with units and direction. F_{net} moet grootte,eenhede en rigting het.	(Towards the batsman is negative) $F_{net} = \frac{\Delta p}{\Delta t}$ $F_{net} = \frac{m(v_f - v_i)}{\Delta t}$ ✓anyone $F_{net} = \frac{0,145(31,39 - (-49,17))}{0.007}$ ✓ ✓ F_{net} = - 1 668,74 N ∴ F_{net} = 1 668,74 N away from the batsman✓

(4)

3.1.5 **Positive marking from 3.1.4**
Positiewe nasien vanaf 3.1.4

1 668,74 N ✓towards the batsman✓ (In the direction of the ball)
Na die kolwer (In die rigting van die bal) (2)

3.1.6
- Newton's third law of motion./*Newton se derde bewegingswet*.✓
- When object **A** exerts a force on object **B**, object **B** simultaneously exerts an oppositely directed force of equal magnitude on object **A**. ✓✓
*Wanneer voorwerp **A**'n krag uitoefen op voorwerp **B**, sal voorwerp **B** gelyktydig 'n gelyke grootte maar teenoorgestelde krag op voorwerp **A** uitoefen.* (3)

3.2.1 A vector quantity./*'n vektorhoeveelheid*✓✓ (2)

3.2.2 Total kinetic energy must NOT be conserved.✓✓
Totale kinetiese energie moet NIE behoue bly nie.
OR/OF
Total kinetic energy before collision must NOT be equal to total kinetic energy after collision.
Totale kinetiese energie voor botsing meot NIE gelyk wees aan die totale kinetiese energie na die botsing nie.
Accept/Aanvaar: $\sum E_k$before collision $\neq$ $\sum E_k$after collision. (2)

3.2.3 $\sum p_i = \sum p_f$
$m_C v_{icar} + m_T v_{itruck} = m_C v_{fcar} + m_T v_{ftruck}$ ✓for any
$m_C v_{iC} + m_T v_{iT} = m_C v_{fC} + m_T v_{fT}$
$m_C v_{iC} + m_T v_{iT} = (m_C + m_T) v_f$
$1\,200(30) + 9\,500(20)$ ✓$= (1\,200 + 9\,500) v_f$✓
$36\,000 + 190\,000 = 10\,700\ v_f$
$226\,000 = 10700 v_f$
$\therefore v_f = 21{,}12$ m.s^{-1} east ✓ (4)
[24]

QUESTION/*VRAAG* 4

4.1.1 Kinetic energy is the energy an object posseses due to its motion. ✓✓
Kinetiese energie is die energie wat n voorwerp besit as gevolg van sy beweging.
OR/*OF*
Kinetic energy is the energy of an object by virtue of its motion. ✓✓ (2)

4.1.2 The total mechanical energy in an isolated system✓remains constant.✓
Die totale meganiese energie in 'n geïsoleerde sisteem bly konstant.
OR/OF
The sum of gravitational potential energy and kinetic energy of an isolated system✓remains constant. ✓
Die som van die potensiële en kinetiese energie van 'n geïsoleerde sisteem bly konstant. (2)

4.1.3 $(E_m)_{Top} = E_p + E_k$
$ME = E_k + E_p$
$ME = mgh + \frac{1}{2}mv^2$ ✓any one

$= (0,56)(9,8)(8) + \frac{1}{2}(0,56)(0)^2$✓

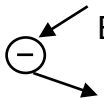
$= 43,90$ J ✓ (3)

4.1.4

POSITIVE MARKING FROM 4.1.3 **POSITIEWE NASIEN VANAF 4.1.3**	
OPTION 1/*OPSIE* 1	**OPTION 2/*OPSIE* 2**
$(M_E)_{3,5} = (M_E)_{Top}$ $(E_p + E_k)_{3,5} = (M_E)_{Top}$ $(mgh + E_k)_{3,5} = (M_E)_{Top}$ ✓for any $(0,56)(9.8)(3,5) + E_k = 43,90$ ✓ $E_k = 24,696$ J $\frac{1}{2}mv^2 = 24,696$ $\frac{1}{2}(0,56)v^2 = 24,696$✓ $v = 9,39$ m.s^{-1}✓	$(M_E)_{3,5} = (M_E)_{Top}$ $(E_p + E_k)_{3,5} = (M_E)_{Top}$ $(mgh + E_k)_{3,5} = (M_E)_{Top}$ $(mgh + \frac{1}{2}mv^2)_{3,5} = (M_E)_{Top}$ ✓for any $(0,56)(9.8)(3,5) + \frac{1}{2}(0,56)v^2$✓ $= 43,90$ ✓ $19,208 + 0,28v^2 = 43,90$ $v^2 = 88,186$ $v = 9,39$ m.s^{-1}✓
OPTION 3/*OPSIE* 3	**OPTION 4/*OPSIE* 4**
Gain in E_k= loss in E_p $\Delta E_k = \Delta E_p$ $\Delta E_p = mg(\Delta h)$ ✓for any $= (0,56)(9,8)(4,5)$ $= 24,70$ J $\therefore \Delta E_K = 24,696$ J✓ $\frac{1}{2}mv^2 = 24,696$ $\frac{1}{2}(0,56)v^2 = 24,696$✓ $v = 9,39$ m.s^{-1}✓	$(M_E)_{(Top)} = (E_p + E_k)_{(Top)}$ $= mgh + \frac{1}{2}mv^2$ ✓for any $= (0,56)(9,8)(8) + \frac{1}{2}(0,56)(0)^2$✓ $= 43,90$ J $(M_E)_{(3,5)} = (E_p + E_k)_{(3,5)}$ $= mgh + \frac{1}{2}mv^2$ $= (0,56)(9.8)(3,5) + E_k$✓ $= 19,208 + E_k$ But$(M_E)_{(3,5)} = (M_E)_{(Top)}$✓ (Isolated system) $19,208 + E_k = 43,90$ J $E_k = 24,692$ J $\frac{1}{2}mv^2 = 24,692$ $\frac{1}{2}(0,56)v^2 = 24,692$ $v^2 = \frac{2 \times 24,692}{0,56}$ $v = 9,39$ m.s^{-1}✓

(4)

4.1.5 **APPLY POSITIVE MARKING FROM 4.1.3 FOR THE VALUE OF E_K**
PAS POSITIEWE NASIEN TOE VANAF 4.1.3 VIR DIE WAARDE VAN E_K



E_k = 43,90 J ✓

The system is isolated, ✓ the kinetic energy at the bottom is equal the gravitational potential energy at the top. ✓
Die sisteem is geïsoleerd, so die kinetiese energie onder is gelyk aan die gravitasie potensiële energie aan die bopunt.
OR/*OF*
The mechanical energy is conserved✓because the system is isolated. ✓
Die meganiese energie bly konstant want die sisteem is geïsoleerd. (3)

4.2.1 Work done is the product of the force applied on an object and the displacement ✓ in the direction of the force.✓
Werk gedoen is die produk van die toegepaste krag op 'n voorwerp en die verplasing in die rigting van die krag. (2)

4.2.2 $W_f = F_f \Delta x \cos\theta$
$W_f = F_f \Delta x \cos 180^0$ ✓
$= (40)(9)(-1)$✓
$= -360$ J ✓

Do not penalise: Moenie penaliseer vir: $W = F\Delta x\cos\theta$ (3)

4.2.3 90^0✓

ACCEPT:
At right angles to each other/ Perpendicular to each other.
Aanvaar:
Loodreg tot mekaar/ (1)

4.2.4

DO NOT PENALIZE FOR OMISSION OF *NET* **MOENIE PENALISEER VIR DIE WEGLATING VAN *NET***	
OPTION 1/*OPSIE* 1	**OPTION 2/*OPSIE* 2** **Positive marking from 4.2.2** **Positiewe nasien vanaf 4.2.2**
$W_{net} = F_{net}\Delta x\cos\theta$✓ $= (200 - 40)$✓ $(9)(\cos 0^0)$✓ $= (160)(9)(1)$ W_{net} = 1 440 J **OR** W_{net} = 1,44 kJ ✓	$W_{net} = W_f + W_F$✓ $= F_f\Delta x\cos 180^0 + F_a\Delta x\cos 0^0$ $= 40 \times 9 \times -1$ ✓ $+ 200 \times 9 \times 1$ ✓ W_{net} =1 440 J **OR** W_{net} = 1,44 kJ ✓

OPTION 3/ OPSIE 3
$F_{net} = F_a + F_f$ $= 200 + (-40)$ $F_{net} = 160$ N ✓ $W_{net} = F_{net}\Delta x \cos\theta$ ✓ $= 160 \times 9 \times \cos 0^0$ ✓ $W_{net} = 1\,440$ J **OR** $W_{net} = 1{,}44$ kJ ✓

(4)
[24]

QUESTION/*VRAAG* 5

5.1.1 Stress is internal restoring force ✓ per unit area ✓ of a body.
Druk(Spanning) is die interne herstelkrag per eenheidsoppervlakte van die liggaam. (2)

5.1.2 $\text{Stress} = \frac{\text{Force}}{\text{Area}}$

$\sigma = \frac{F}{A}$ ✓ for any

$\sigma = \frac{3 \times 10^3\ \text{N}}{1{,}44 \times 10^{-4}\ \text{m}^2}$ ✓

$= 20{,}83 \times 10^6$ Pa / 20,83 Mpa ✓

(3)

5.1.3

OPTION 1/ OPSIE 1	**OPTION 2/ OPSIE 2**
$\text{Strain} = \frac{\text{change in length}}{\text{original length}}$ $\varepsilon = \frac{\Delta \ell}{L}$ ✓any one $\varepsilon = \frac{252 - 250}{250}$ ✓ $\varepsilon = 0{,}008$ $= 8 \times 10^{-3}$ ✓	$\text{Strain} = \frac{\text{change in length}}{\text{original length}}$ $\varepsilon = \frac{\Delta \ell}{L}$ ✓any one $\varepsilon = \frac{252 - 250}{250}$ ✓ $\varepsilon = 0{,}008$ $= 8 \times 10^{-3}$ ✓

OPTION 3/ *OPSIE* 3	**OPTION 4/ OPSIE 4**
Strain = $\frac{\text{change in length}}{\text{original length}}$ ✓any one $\varepsilon = \frac{\Delta \ell}{L}$ $\varepsilon = \frac{0{,}252 - 0{,}250}{0{,}250}$ ✓ $\varepsilon = 0{,}008$ $= 8 \times 10^{-3}$ ✓	Strain = $\frac{\text{change in length}}{\text{original length}}$ ✓any one $\varepsilon = \frac{\Delta \ell}{L}$ $\varepsilon = \frac{0{,}002}{0{,}250}$ ✓ $\varepsilon = 0{,}008$ $= 8 \times 10^{-3}$ ✓

(3)

5.1.4 When the modulus of elasticity increases, the flexibility of the material decreases.✓✓
Wanneer die modulus van elastisiteit verhoog, sal die fleksiteit van die stof verlaag.
OR/*OF*
A material with a higher flexibilty has a lower modulus of elasticity.✓✓
'n Stof met 'n hoër fleksiteit het 'n laer modulus van elastisiteit.

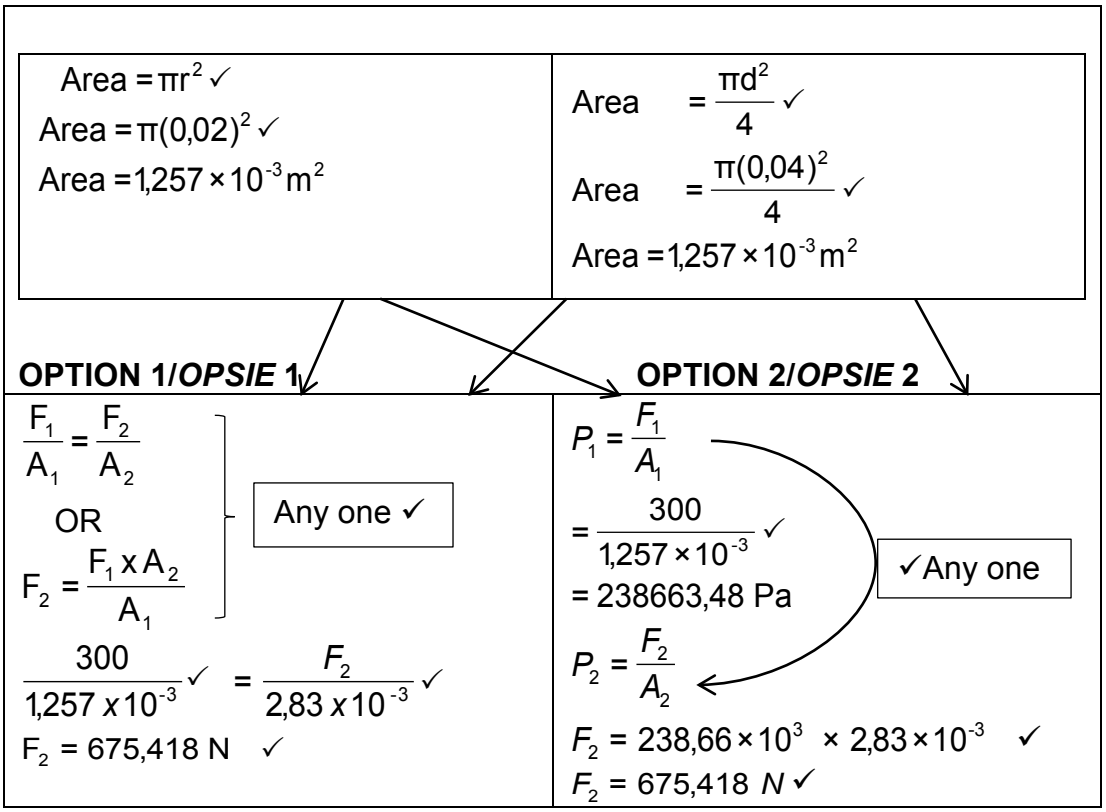
(2)

5.2.1

OPTION 1/*OPSIE* 1	**OPTION 2/*OPSIE* 2**
Area = πr^2 $r^2 = \frac{\text{Area}}{\pi}$ Any one✓ $r = \sqrt{\frac{2{,}83 \times 10^{-3}}{\pi}}$ ✓ $r = 0{,}03\ m$ $r = 30\ mm$ Any one✓	Area $= \frac{\pi d^2}{4}$ $d^2 = \frac{\text{Area} \times 4}{\pi}$ Any one✓ $d = \sqrt{\frac{2{,}83 \times 10^{-3} \times 4}{\pi}}$ ✓ $d = 0{,}06\ m$ $d = 60\ mm$ $r = 0{,}03\ m$ $r = 30\ mm$ Any one ✓

(3)

5.2.2



(6)

5.2.3 ANY FOUR/ENIGE VIER

- Car lifts./*Hidrouliese hysers*✓
- Jacks./*Domkrag*✓
- Hydraulic brakes./*Hidrouliese remme*✓
- Dentist chairs./*Tandartsstoele*✓
- Forklifts/Vurkhysers (4)

[23]

QUESTION/*VRAAG* 6

6.1 Capacitance is the amount of charge a capacitor can store per volt.✓✓
Kapasitansie is die hoeveelheid lading wat 'n kapasitor kan stoor. (2)

6.2 If distance between the plates increases then capacitance decreases.✓✓
Indien die afstand tussen die plate toeneem, sal die kapasitansie afneem. (2)

6.3 X: Anode ✓ **Accept:** A/ Positive terminal/ P-type
X: Anode Aanvaar: A/Positiewe pool/ P-tipe
Y: Cathode✓**Accept:** C/ Negative terminal/ N-type
Y: Katode Aanvaar:K/ Negatiewe pool/ N-tipe (2)

[6]

QUESTION/*VRAAG* 7

7.1 The rate at which electrical energy is converted (in an electrical circuit).✓✓
Die tempo waarteen elektriese energie omgesit word in 'n elektriese stroombaan.
OR/*OF*
The rate at which work is done. ✓✓
Die tempo waarteen werk gedoen word.
OR/OF
The rate at which energy is transferred. ✓✓
Die tempo waarteen energie oorgedra word. (2)

7.2.1

OPTION 1/*OPSIE* 1	**OPTION 2/*OPSIE* 2**	**OPTION 3/*OPSIE* 3**

$\frac{1}{R_{//}} = \frac{1}{R_1} + \frac{1}{R_2}$
$= \frac{1}{5} + \frac{1}{2}$ ✓
$= \frac{7}{10}$
$R_{//} = \frac{10}{7} = 1{,}43\ \Omega$
$R_t = R_{//} + R_3$
$= 1{,}43 + 2$ ✓
$= 3{,}43\ \Omega$✓
	$R_P = \frac{R_1 x R_2}{R_1 + R_2}$
	$R_p = \frac{5 \times 2}{5 + 2}$ ✓
	$= \frac{10}{7}$
	$= 1{,}43\ \Omega$
	$R_t = R_P + R_3$
	$= 1{,}43 + 2$ ✓
	$= 3{,}43\ \Omega$✓
		$R_t = [\frac{1}{R_1} + \frac{1}{R_2}]^{-1} + R_3$
		$= [\frac{1}{5} + \frac{1}{2}]^{-1} + 2$
		$= 1{,}43$✓ $+ 2$ ✓
		$= 3{,}43\ \Omega$✓

(3)

7.2.2. Increases. ✓✓
Verhoog (2)

7.2.3 Increases. ✓✓
Verhoog (2)

7.3

OPTION 1/*OPSIE* 1	**OPTION 2/*OPSIE* 2**
$P = VI$ $P = \underline{230 \times 20}$ ✓ $P = 4\,600\ W$ $P = 4{,}6\ kW$ Any one✓ $E = Pt$ $E = 4{,}6 \times \underline{1}$ ✓ $E = 4{,}6\ kWh$ Cost of electricity = energy used x tariff = 4,6 x 0,85 ✓ = R3,91 ✓	$W = Pt$ $W = (VI)t$ Any one✓ $W = (\underline{230 \times 20})$✓ $\times \underline{1}$ ✓ $W = 4600\ Wh$ $W = 4{,}6\ kWh$ Cost of electricity = energy used x tariff = 4,6 x 0,85 ✓ = R3,91 ✓

(5)
[14]

QUESTION/*VRAAG* 8

8.1 Hold the conductor in your right hand such that your thumb points in the direction of the conventional current✓then your fingers curl in the direction of the magnetic field.✓
Hou die geleier in jou regterhand sodat jou duim in die rigting van die konvensionele stroom wys en jou vingers krul in die rigting van die magneetveld. (2)

8.2 The number of fieldlines (perpendicular) per unit area.✓✓
Die aantal veldlyne loodreg per eenheids oppervlakte. (2)

8.3.1 The galvanometer needle will deflect to one side (and deflect back to zero).✓
Die naald op die galvanometer sal na een kant uitwyk(en weer terug na nul).
OR/ OF
The galvanometer will show a new reading and (and deflect back to zero). ✓
Die galvanometer sal 'n nuwe lesing toon en (en weer terug na nul) (1)

8.3.2 Faraday's law ✓

–

When the magnetic flux linked with the coil changes, an emf is induced in the coil.✓The magnitude of the induced emf is directly proportional to the rate of change of the magnetic flux.✓
Wanneer die magnetiese vloed wat met die spoel verbind is verander, 'n Emk in die spoel geinduseer word. Die grootte van die geinduseerde emk is direk eweredig aan die tempo van verandering van die magnetiese vloed. (3)

8.3.3 The reading on the galvanometer will increase.✓✓
Die lesing op die galvanometer sal verhoog.
OR/ OF
The needle of the galvanometer will deflect more. ✓✓
Die naald van die galvanometer sal verder uitwyk.
OR/ OF
Induced current increases ✓✓
Geinduseerde stroom sal verhoog. (2)

8.4 Lenz's law states that the direction of the induced emf in the coil opposes the effect that produced it.✓✓
Lenz se wet verklaar dat die rigting van die geïnduseerdeemk in die spoel die aksie teenstaan wat dit veroorsaak. (2)
[12]

QUESTION/*VRAAG* 9

9.1.1 Step-down✓
Verlaging

There are more turns on the primary coil than on the secondary coil. ✓
Daar is meer windings op die primêre spoel dan die sekondêre spoel.

ACCEPT:
There is more voltage on the primary coil than on the secondary coil.
Aanvaar:
Daar is n groter volt op die primere as op die sekondere spoel. (2)

9.1.2

OPTION 1	**OPTION 2**
$\frac{V_P}{V_S}=\frac{N_P}{N_S}$ $V_P=\frac{N_P}{N_S}\times V_S$ Any one✓ / *Enige een* $\frac{V_P}{24}=\frac{1200}{60}$ ✓ V_P= 480 V ✓	$\frac{V_s}{V_P}=\frac{N_S}{N_P}$ $V_P=\frac{N_P}{N_S}\times V_S$ Any one✓ / *Enige een* $\frac{24}{V_P}=\frac{60}{1200}$ ✓ V_P= 480 V ✓

(3)
[5]

TOTAL/*TOTAAL*: 150