

**GAUTENG DEPARTMENT OF EDUCATION /
GAUTENGSE DEPARTEMENT VAN ONDERWYS
SENIOR CERTIFICATE EXAMINATION /
SENIORSERTIFIKAAT-EKSAMEN**

**FUNCTIONAL PHYSICAL SCIENCE SG
FUNKSIONELE NATUUR- EN SKEIKUNDE SG
(First Paper: Physics/Eerste Vraestel: Fisika)**

POSSIBLE ANSWERS OCT / NOV 2006

QUESTION 1 / VRAAG 1

- 1.1 A
- 1.2 D
- 1.3 C
- 1.4 C
- 1.5 A
- 1.6 C
- 1.7 D
- 1.8 B
- 1.9 D
- 1.10 B
- 1.11 C
- 1.12 C
- 1.13 D
- 1.14 B
- 1.15 B

15x3=[45]

QUESTION 2 / VRAAG 2

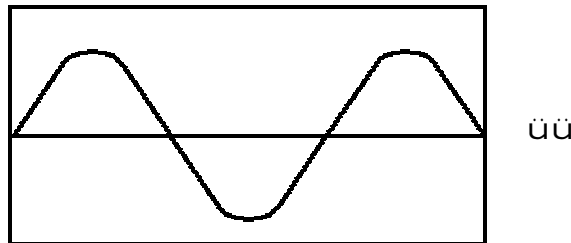
- 2.1 2.1.1 Electromagnetic induction: Current is induced in a conductor that is moved at right angles through a magnetic field.

Elektromagnetiese induksie : Stroom word in geleier geïnduseer wat 90° deur 'n magneetveld beweeg word.

- 2.1.2 Right-hand dynamo rule. / Regterhand-dinamoreël.

(4)

- 2.1.3



(2)

- 2.1.4 Alternating current dynamo / Transformer. / Wisselstroom-dinamo / Transformators.

(2)

- 2.1.5 More turns; / Meer windings;
 Greater rotational speed; / Groter rotasiespoed;
 Stronger magnetic field. / Sterker magneetveld.

(6)

$$2.1.6 \quad f = \frac{3000}{60} = 50 \text{ Hz}$$

(3)

- 2.2 2.2.1 Brushes. / Borsels.

(2)

- 2.2.2 Slip rings. / Sleepringe.

(2)

[23]

QUESTION 3 / VRAAG 3

- 3.1 3.1.1 Movement of charges (from positive to negative). / Ladings wat beweeg (van positief na negatief).

(2)

- 3.1.2 Movement of electrons (from negative to positive). / Elektrone beweeg (van negatief na positief).

(2)

- 3.2 3.2.1 Capacitor. / Kapsitor.

(2)

- 3.2.2 Stores charge. / Stoor lading.

(2)

- 3.2.3 Smoothed rectified current. / Halfgelykgerigte stroom.

(2)

- 3.3 3.3.1 Heat cathode. / Verhit katode. (2)
- 3.3.2 Decrease to no reading. / Afneem na geen lesing. (2)
- 3.3.3 Anode charged negatively now - therefore no e⁻ attraction.
Anode nou negatief gelaai - dus geen e⁻-aantrekking. (2)
- [16]

QUESTION 4 / VRAAG 4

$$4.1 \quad \frac{1}{R_p} = \frac{1}{R_1} + \frac{1}{R} = \frac{1}{80} + \frac{1}{20} = 0,0125 + 0,05 = 0,0625$$

$$R_p = \frac{1}{0,0625} = 16 \Omega$$

$$R_{TOT} = R_p + R_s = 16 \Omega + 2 \Omega = 18 \Omega \quad (5)$$

$$4.2 \quad I = \frac{V}{R} = \frac{150}{18} = 8,3 \text{ A} \quad (4)$$

$$4.3 \quad V = I R_p = 8,3(16) = 132,8 \text{ V}$$

$$I_{\otimes} = \frac{V}{R} = \frac{132,8}{80} = 1,66 \text{ A} \quad (5)$$

4.4 Shorter. / Korter. (2)

$$4.5 \quad W = I^2 R t$$

$$t = \frac{W}{I^2 R}$$

W = constant / konstant

R = constant = 20 Ω = konstant

(6,6 A \rightarrow 7 A)

I? increase / neem toe.

t? decreases / neem af

OR
OF

If lamp is removed the resistance of parallel circuit will increase, thus the current in the series circuit will decrease. this means that the emf across the ammeter will decrease and a higher emf will be applied to the heater. Thus a higher current through the heater and the water will boil faster. / Indien die lampie uit parallel baan verwyder word, sal die stroom toeneem, sodat die serie-stroom sal afneem. Dit laat p.v. oor ammeter afneem en hoër p.v. oor die verwarmers laat. Dus vloei 'n groter stroom deur die verwarmers en water kook dus vinniger.

(4)
[20]

QUESTION 5 / VRAAG 5

- 5.1 5.1.1 $5 + (-2) = 3 \text{ m}$ (2)
- 5.1.2 Interference. / *Interferensie.* (2)
- 5.1.3 Move on in the original direction with the original magnitude. /
Voortbeweeg in oorspronklike rigting met oorspronklike grootte. (2)
- 5.2 5.2.1 Interference because of diffraction. / *Interferensie a.g.v. diffraksie.* (2)
- 5.2.2 Nodal and anti-nodal lines. / *Nodale en anti-nodale lyne.* (2)
- 5.2.3 Because of constructive and destructive interference.
A.g.v. konstruktiewe en destruktiewe interferensie. (2)
- 5.2.4 Increase distance between slits. Shorter wavelengths of plane waves.
Vergroot afstand tussen openinge. Korter golflengte van vlakgolwe. (4)
- 5.3 5.3.1 $\frac{30}{1\ 000} = 0,03 \text{ m}$ (2)
- 5.3.2 $f = \frac{1}{T} = \frac{1}{0,3} = 3,33 \text{ Hz}$ (3)
- 5.3.3 $v = f \cdot \lambda = 3,33 \times 0,09 = 0,3 \text{ m/s}$ (4)

[25]

QUESTION 6 / VRAAG 6

- 6.1 6.1.1 The three primary (red, yellow and green) colours together, produce white light /
Die drie primêre kleure (rooi, geel en groen) saam, lewer wit lig. (1)
- 6.1.2 Dispersion. / *Dispensie.* (2)
- 6.1.3 Continuous spectrum. / *Kontinue spektrum.* (2)
- 6.1.4 Violet. (2)
- 6.1.5 Red. / *Rooi.* (2)
- 6.1.6 Undergoes refraction only. / *Net breking ondergaan.* (2)
- 6.1.7 Continuous spectrum / *Kontinue spektrum* (2)

6.2 6.2.1 Line spectra. / *Lynspektrums.* (2)

6.2.2 Under certain circumstances e^- are excited to higher fixed energy levels. When these e^- fall back to ground state, light of specific frequency is emitted and a line spectrum is observed.

e^- verkry energie en skuif na hoër energievlakke; straal hierdie hoeveelheid energie uit as 'n sekere kleur lig en beweeg terug na grondtoestand-energievlak.

(4)

6.2.3 Identifying of flame salts. / *Identifisering van vlamsoute.* (2)
[21]

TOTAL / TOTAAL: 150