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 / MOONTLIKE ANTWOORDE SUPP 2007

QUESTION 1 / *VRAAG 1*

1.1 C

1.2 A

1.3 A

1.4 C

1.5 B

1.6 C

1.7 B

1.8 A

1.9 B

1.10 C

1.11 D

1.12 D

1.13 A

1.14 D

1.15 B

15x3=**[45]**

QUESTION 2 / *VRAAG 2*

2.1 2.1.1 Clockwise. / *Kloksgewys (regsom).* ü ü (2)

2.1.2 Motor effect: A force is experienced by a current bearing conductor in a magnetic field.

Motoreffek: 'n Stroomdraende geleier in 'n magneetveld sal 'n krag ondervind. ü ü ü ü (4)

2.1.3 Left-hand motor rule. / *linkerhand-motorreël.* ü ü (2)

2.1.4 Clockwise. / *Kloksgewys*. ü ü (2)

2.1.5 Electric motors and (A) / (V) / (G). / *Elektriese motors en* (A) / (V) / (G). ü ü ü ü (4)

2.1.6 More turns; / *Meer windings;* ü ü
Larger current strength; / *Sterker stroom;* ü ü
Stronger magnetic field. / *Sterker magneetveld.* ü ü (6)

2.2 2.2.1 Brushes. / *Borsels*. ü ü (2)

2.2.2 Splitring commutator. / *Splitringkommutator*. ü ü (2)

2.3 To change the direction of the current so that the turn keep rotating in one direction.

Om stroomrigting om te keer sodat die winding in dieselfde rigting bly roteer. ü ü ü (3)

[27]

QUESTION 3 / *VRAAG 3*

3.1 AC: Current strength and -direction change constantly
DC: Current strength and -direction stay constant

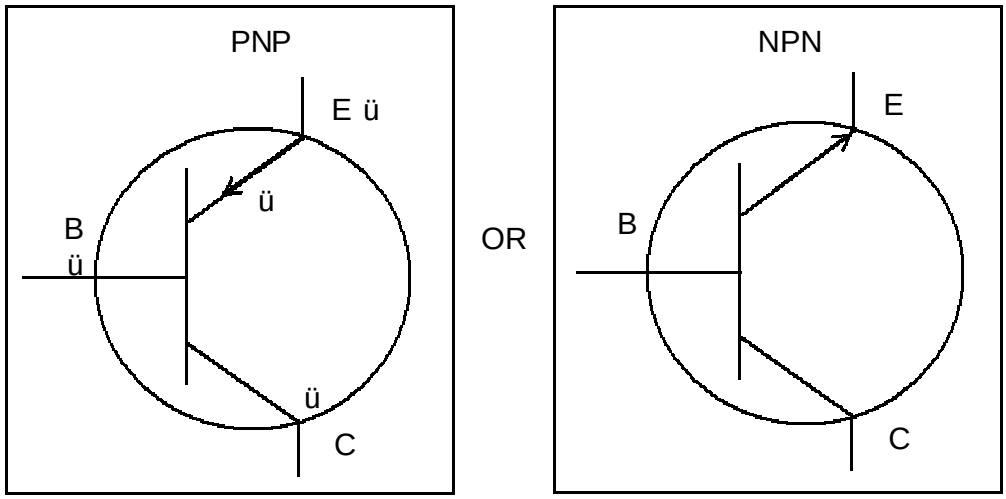
WS: Stroomsterkte en -rigting wissel gedurig.

GS: Stroomsterkte en -rigting bly konstant. (4)

3.2 3.2.1 Diode. (2)

3.2.2 To rectify current. / *Om stroom gelyk te rig./ in slegs een rigting te laat vloei*
To allow current to flow in only one direction (2)

3.3



(4)
[12]

QUESTION 4 / *VRAAG 4*

4.1 4.1.1 Low, so as not to influence current in series / *Laag sodat dit nie stroom in serie beïnvloed nie.* (2)

4.2.2 High

Hoë (2)

4.2 $\frac{1}{R_P} = \frac{1}{R_1} + \frac{1}{R_2} = \frac{1}{3} + \frac{1}{5} = 0,33 + 0,2 = 0,53$

$R_P = \frac{1}{0,53} = 1,89\,\Omega$

$R_T = R_P + R_S = 1,89 + 7 + 9 + 17,89\,\Omega$ (6)

4.3 $I = \frac{V_P}{R_P} = \frac{12}{1,8} = 6,35\ A$ ü ü ü

(4)

4.4 Decreases. / *Afneem.* ü ü (2)

4.5 $I\downarrow = \frac{V}{R\uparrow}$ ü

Resistance P of parallel circuit increases. P
Resistance of series P circuit increases P.

Weerstand in parallelkring neem toe.
Weerstand in seriekring neem toe. (4)
[20]

QUESTION 5 / *VRAAG 5*

5.1 Blue and dark stripes. / *Blou en donker strepe.* ü ü (2)

5.2 Interference because of diffraction. / *Interferensie a.g.v. diffraksie.* ü ü (2)

5.3 No difference. / *Geen verskil*. ü ü (2)

5.4 Red and dark stripes further apart than in Question 5.1.

Rooi en donker strepe verder uitmekaar as in Vraag 5.1. ü ü (2)

5.5 Red's longer wavelength causes it to be further apart than blue.

Rooi se golflengte is langer, vandaar dat hulle verder uitmekaar is. ü ü ü ü (4)

5.6 Red and dark stripes will be closer together.

Rooi en donker strepe nader aan mekaar. ü ü (2)

5.7 The further apart the slits the better the diffraction: the distance between points of constructive interference is decreased

Hoe verder die splete uit mekaar, hoe kleiner die afstand tussen 2 konstruktiewe interferensiepunte ü ü ü (4)

5.8.1 Gamma & X-rays. / *Gamma- & X-strale.* ü ü (2)

5.8.2 (a) $f = \frac{1}{T} = \frac{1}{4 \times 10^{-15}}$ ü

$= 2,5 \times 10^{14}$ Hz ü (2)

$c = f.\lambda$ ü

$\therefore \lambda = \frac{c}{f} = \frac{3 \times 10^{8}}{2,5 \times 10^{14}}$ ü

$= 1,2 \times 10^{-6}$ m ü (4)

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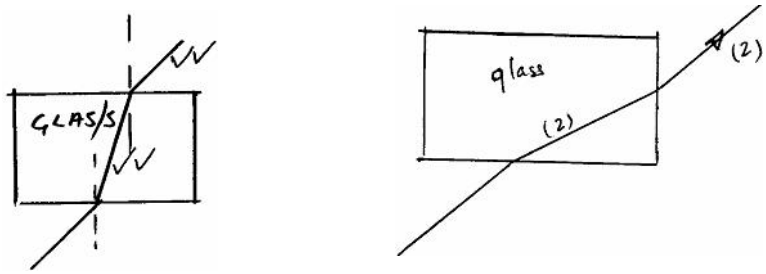
QUESTION 6 / *VRAAG 6*

6.1 6.1.1 Speed, direction and wavelength change.

Spoed, rigting en golflengte verander. ü ü ü ü (4)

6.1.2



ü ü (4)

6.1.3 Refraction / *Breking* (2)

6.2 6.2.1 See if it undergoes any more dispersion through an even sided prism, or view light through a diffraction grating or spectroscope.

Kyk of dit nog dispersie deur 'n gelyksydige prisma ondergaan, of bekyk lig deur 'n diffraksierooster of spektroskoop. ü ü (2)

6.2.2 Linespectrum. / *Lynspektrum*. ü (1)

6.2.3 e^- accepts energy; moves to further energy level/s; radiates extra energy as a certain colour; moves (fall) back to ground level energy level.

e^- wat energie opneem; beweeg na verdere energievlakke; straal verkrygde energie uit as sekere kleur; beweeg (val) terug na grondtoestand-energievlak. ü ü ü ü (4)

6.2.4 No. / *Nee.* ü (1)

6.2.5 Identifying of unknown metals with their line spectra of their flame salts.

Identifisering van onbekende metale deur hul vlamsoute se lynspektrums. ü ü (2)

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TOTAL / *TOTAAL*: 150