

**GAUTENG DEPARTMENT OF EDUCATION
SENIOR CERTIFICATE EXAMINATION**

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

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

3x15 = [45]

2.1 $\frac{N_s}{N_p} = \frac{V_s}{V_p}$

$$N_p = \frac{N_s V_p}{V_s} = \frac{360(220)}{90} = 880 \text{ windings/turns} \quad (5)$$

2.2 Verlagings transformator/*Stepdown transformer* (1)

2.3 $I_s V_s = I_p V_p$
 $\rightarrow I_s = \frac{I_p V_p}{V_s} = \frac{0.3(220)}{12} = 5.5 \text{ A}$
 = (5)

2.4 Diode: Sodat wisselstroom gelykgerig word/*Diode: so that the alternating current can be rectified to direct current* (4)
 [15]

3.1 $V = 5(1,5) = 7,5(V)$ Ammeter A = Zero (2)

3.2 $\frac{1}{R_p} = \frac{1}{R_1} + \frac{1}{R_2}$
 $= \frac{1}{3} + \frac{1}{7}$
 $\frac{1}{R_p} = 0,476$
 $R_p = 2,1\Omega$
 $R_T = R_p + R_s$
 $= 2,1 + 0,9$
 $= 3\Omega$ (5)

$$3.3 \quad I = \frac{V}{R} = \frac{7,5}{3} = 2,5 \text{ A} \quad (4)$$

$$3.4 \quad V_p = I R_p = 2,5(2,1) = 5,25 \text{ V} \quad I = \frac{V_p}{R} = \frac{5,25}{3} = 1,75 \text{ A} \quad (7)$$

3.5 Dowwer/Dimmer (1)

3.6 Weerstand groter, dus stroom kleiner/Resistance more, current less (3)
[22]

4.1.1 Ja/yes. Steurings is loodreg m.b.t. die golfrigting. Disruptions are perpendicular to the wave direction. (3)

4.1.2 Ja/yes. Vibreer slegs in een vlak/Vibrates in one plane only (3)

$$4.1.3 \quad \text{Amplitude} = \frac{0,009}{2} = 4,5 \times 10^{-3} \text{ m} \quad (2)$$

$$4.1.4 \quad f = \frac{1}{T} = \frac{1}{0,65} = 1,67 \text{ Hz} \quad (3)$$

$$4.1.5 \quad v = f \lambda = 1,67 (0,05) = 0,0835 \text{ m/s} \quad (4)$$

4.2.1 Frekwensie/frequency (1)

4.2.2 X-strale- ; Gamma strale/rays (2)

$$4.2.3 \quad f = \frac{1}{T} = 2,5 \times 10^{13} \text{ Hz}$$

$$\lambda = \frac{v}{f}$$

$$= \frac{3 \times 10^8}{2,5 \times 10^{13}} = 1,2 \times 10^{-5} \text{ m} \quad (6)$$

[24]

5.1.1 Lynspektrum/Line spectrum (1)

$$5.1.2 \quad v = f \cdot \lambda \Rightarrow \lambda = \frac{v}{f} = \frac{3 \times 10^8}{6,9 \times 10^{14}} = 4,35 \times 10^{-7} \text{ m} \quad (4)$$

5.2.1 a) 1 (1)
b) 2/3/4 (2)

5.2.2 Elektrone neem energie op, beweeg na energievakke verder weg van die kern; straal energie opgeneem uit as lig met 'n sekere frekwensie (kleur)/*Electrons absorb energy; move to energy levels further from the nucleus; radiate this absorbed energy at a certain frequency (colour)* (3)
[11]

6.1 Verhit die katode/*heating of cathode* (2)

6.2.1 Elektrone/*Electrons* (1)

6.2.2 Termioniese emissie/*Thermionic emission* (2)

6.3.1 Direk verhitte termioniese diode/*Direct heated thermionic diode*
 Elektrone van C afgekook om 'n eenrigting stroom te bewerkstellig./*Electrons are boiled from C to accomplish a current in one direction.* (4)

6.3.2 Positief/*Positive*. Om elektrone aan te trek/*To attract the negative electrons* (3)

6.4.1 Wisselstroom/*Alternating current* (2)

6.4.2  (2)

6.5.1 Gelykstroom/*Direct current* (2)

6.5.2  (2)

6.6.1 Lading te stoor/*To store charge* (2)

6.6.2  (2)
[24]

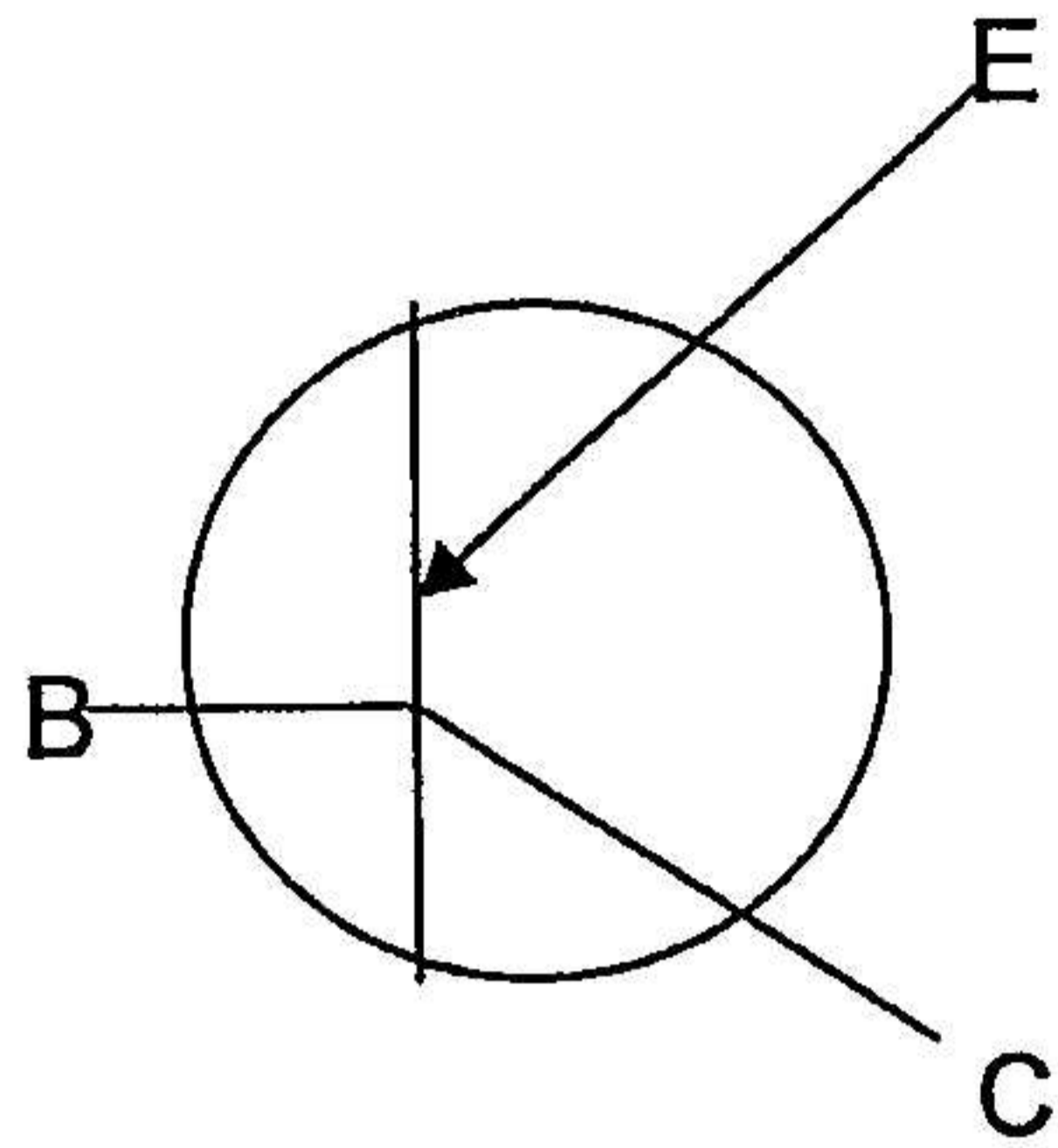
7.1 Transistor

(2)

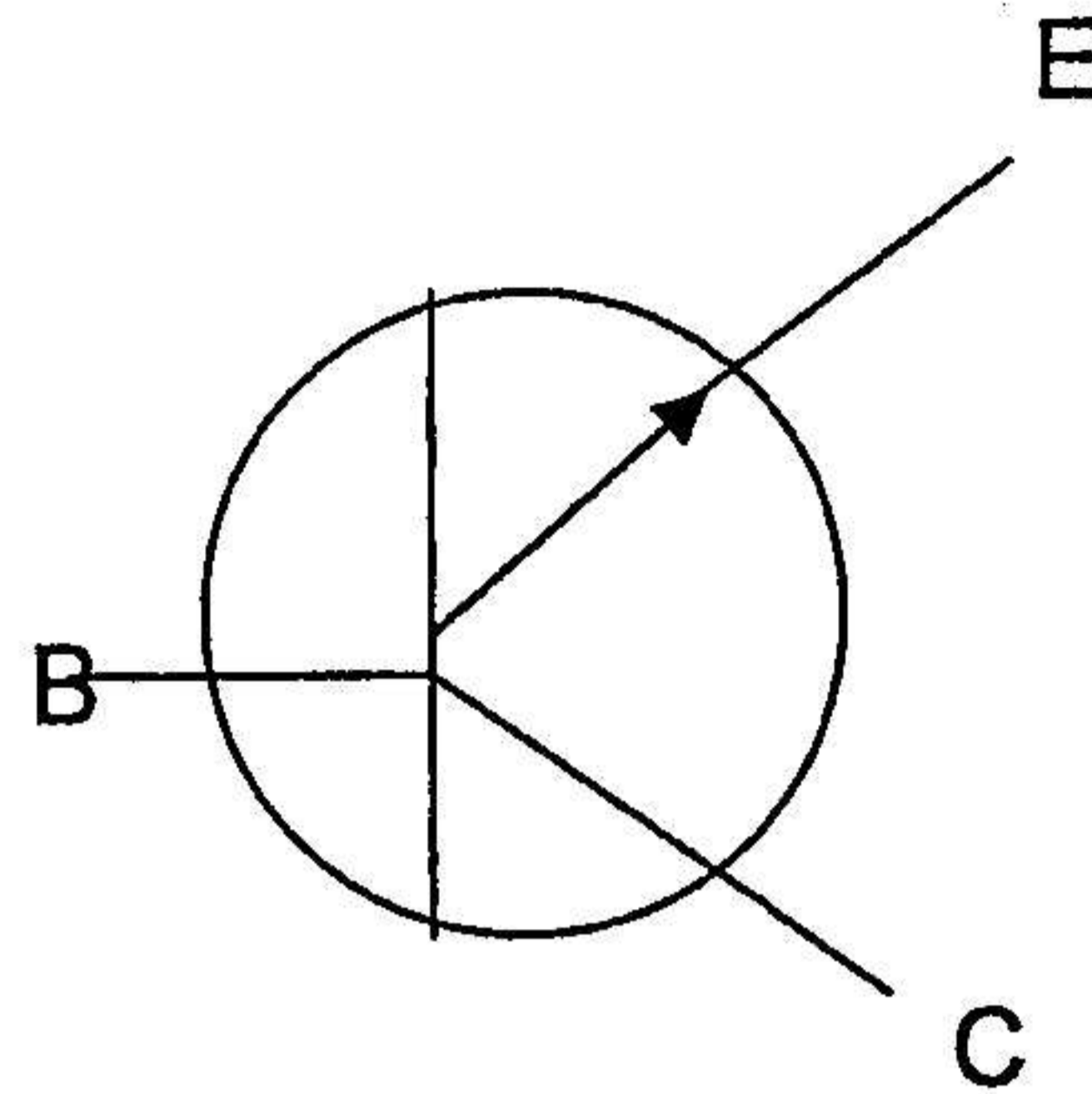
7.2 Spanningsversterkers/*Potential amplifiers*
Elektroniese skakelaars/*Electronic switches*

(2)

7.3



1 for sketch
OR



pnp

npn

(5)
[9]

TOTAAL / TOTAL: [150]