KWAZULU-NATAL PROVINCE
EDUCATION
REPUBLIC OF SOUTH AFRICA

NATIONAL SENIOR CERTIFICATE

GRADE 10

PHYSICAL SCIENCES P1

COMMON TEST
MARKING MEMORANDUM
JUNE 2025

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MARKS: 75

DURATION: 1,5 hours

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QUESTION 1

1.1 C ✓✓ (2)
1.2 B ✓✓ (2)
1.3 A ✓✓ (2)
1.4 D ✓✓ (2)
1.5 C ✓✓ (2)
[10]

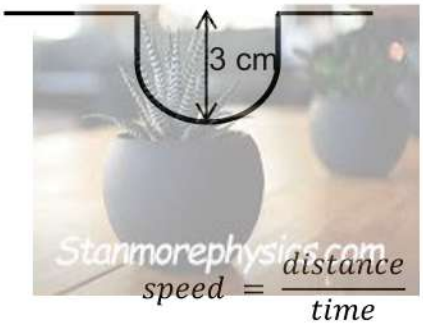
QUESTION 2

2.1

2.1.1 Destructive (interference) ✓ (1)

2.1.2 3 cm (Accept: - 3 cm) ✓ (1)

2.1.3 Criteria
Shape: Pulse drawn as trough ✓
Amplitude of pulse = 3 cm ✓ (2)



2.1.4 Pulse A:

$$speed = \frac{distance}{time}$$

$$0,05 = \frac{0,25}{time}$$

time = 5 s

Pulse B:

$$speed = \frac{distance}{time}$$

$$speed = \frac{0,2}{5}$$

= 0,04 m.s^{-1}✓ (5)

2.2

2.2.1 a) 0,05 ✓ (1)
b) 0,15 ✓ (1)
c) 4,5 ✓ (1)

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Distance (1 wave) = speed x time

= 0,5 ✓ x 0,1✓

= 0,05 m

Distance (2 waves) = 0,05 x 2 ✓

= 0,1 m ✓

$$f = \frac{1}{T}$$

$$f = \frac{1}{0,1}$$

= 10 Hz

$v = f \times \lambda$

$0,5 = 10 \times \lambda$

λ = 0,05 m

Distance (2 waves) = 0,05 x 2 ✓

= 0,1 m ✓ (4)

[16]

QUESTION 3

3.1 Sounds with frequencies higher than 20 kHz✓ up to about 100 kHz. ✓ (2)

3.2

$$speed = \frac{distance}{time}$$

$$= \frac{710}{0,47}$$ OR $$= \frac{1420}{0,94}$$

= 1510,64 m.s^{-1}✓ (3)

3.3 **POSITIVE MARKING FROM QUESTION 3.2**

$$speed = \frac{distance}{time}$$

$$1510,64 = \frac{distance}{0,52}$$

distance = 785,53 m.s^{-1}

Distance (between the submarine and shipwreck) = $\sqrt[2]{785,53^2 - 710^2}$✓

= 336,09 m✓ (4)

3.4 **POSITIVE MARKING FROM QUESTION 3.2**

$v = f \times \lambda$ ✓

1510,64 = 30 000 x λ ✓

λ = 0,05 m ✓ (3)

[12]

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QUESTION 4

4.1 Gamma ray, X-ray, Visible light, Microwave, Radiowave ✓✓ (2)

4.2.1 **OPTION 1**

E = h x f ✓

= 6,63 x10^{-34} x 3,02 x10^{19} ✓

= 2 x 10^{-14} J ✓

OPTION 2

c = f x λ

3 x 10^{8} = 3,02 x10^{19} x λ

λ = 9,93 x 10^{-12} m

$$E = \frac{hc}{\lambda}$$

$$= \frac{6{,}63 \times 10^{-34} \times 3 \times 10^{8}}{9.93 \times 10^{-12}}$$

= 2 x 10^{-14} J ✓

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(3)

4.2.2 **OPTION 1**

$$E = \frac{hc}{\lambda}$$ ✓

$$3 \times 10^{-17} = \frac{6{,}63 \times 10^{-34} \times 3 \times 10^{8}}{\lambda}$$

λ = 6,63 x 10^{-9} m ✓

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OPTION 2

E = h x f ✓

3 x10^{-17} = 6,63 x10^{-34} x f ✓

f = 4,525 x10^{16} Hz

c = f x λ

3 x 10^{8} = 4,525 x10^{16} x λ ✓

λ = 6,63 x 10^{-9} m ✓ (4)

4.2.3 (Radiation) B ✓ (1)

[10]

QUESTION 5

5.1.1 A type of contact electrification in which certain materials become electrically charged after they come into contact with different materials and are then separated. ✓✓ (2)

5.1.2 $Q = n\,x\,q_e$ ✓

$= 1{,}88 \times 10^{10}\ x\ -1{,}6 \times 10^{-19}$ ✓

= - 3,01 x 10^{-9} C

Q_{new} = - 2 x 10^{-9} + (- 3,01 x 10^{-9}) ✓

= - 5,01 x 10^{-9} C ✓ (4)

5.2.1 To prevent the flow of electric charge between the sphere and the ground. ✓ (1)

5.2.2

$$Q = \frac{Q_1 + Q_2}{2}$$

$$-1 \times 10^{-6} = \frac{-8 \times 10^{-6} + Q_B}{2}$$

Q_B = 6 x 10^{-6} C (or 6μC) ✓ (4)

[11]

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QUESTION 6

6.1 The v … charge by the source (battery) ✓✓ (2)

6.2 V = IR ✓
= 3 x 2 ✓
= 6 V ✓ (3)

6.3 **POSITIVE MARKING FROM QUESTION 6.2**

6.3.1 Q = I Δt ✓
240 ✓= I x 120 ✓
I = 2A ✓ (4)

6.3.2 **OPTION 1**

$V_{3\Omega}$ = IR
= 2 x 3 ✓
= 6V

I_{Rx} = 3 – 2 ✓
= 1A

V = IR
6 = 1 x R_x ✓
R_x = 6Ω ✓

OPTION 2

I_{Rx} = 3 – 2 ✓
= 1A

$$R_x = \frac{I_{3\Omega}}{I_{Rx}} \times R_{3\Omega}$$

$$R_x = \frac{2}{1} \times 3$$

= 6Ω ✓

(4)

6.3.3 Emf = 6 + 6 ✓
= 12V
Emf (1cell) = 12 ÷ 3 ✓
= 4V ✓ (3)

[16]

TOTAL: 75

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