KWAZULU-NATAL PROVINCE
EDUCATION
REPUBLIC OF SOUTH AFRICA

NATIONAL
SENIOR CERTIFICATE

GRADE 10

PHYSICAL SCIENCES

COMMON TEST

MARCH 2023

MARKING GUIDELINE

TIME: 1 ½ Hour

MARKS: 75

These marking guideline consists of 5 pages.

QUESTION 1

1.1   B ✓✓   (2)

1.2   D ✓✓   (2)

1.3   D ✓✓   (2)

1.4   A ✓✓   (2)

1.5   D ✓✓   (2)

1.6   A ✓✓   (2)
                                                                              [12]

QUESTION 2

2.1   A single disturbance in a medium ✓✓   (2)

2.2   Destructive ✓   (1)

2.3   8 cm ✓   (1)

2.4
        2.4.1 No   ✓   (1)

        2.4.2 According to the principle of superposition✓
               Pulse P will continue moving in its original direction✓   (2)
                                                                               [7]

QUESTION 3

3.1   Transverse   ✓   (1)

3.2   They are moving in different /opposite direction ✓   (1)

3.3
        f= 1/T✓

        = 1/2,5✓
        = 0,4 Hz✓   (3)

3.4   v = f x λ✓
        0,08 = 0,4 x λ ✓
          λ = 0,2 m
          x = 0,35m✓✓   (4)

3.5   8,75 seconds✓✓   (2)

[11]

QUESTION 4

4.1   A sound wave that is reflected ✓off a surface ✓   (2)

4.2   v = f x λ✓
          1500 = 25000 x λ ✓
            λ = 0,06m ✓   (3)

4.3   No. ✓ frequency is beyond range for the human ear ✓   (2)

4.4   speed = $\dfrac{D}{\Delta t}$ ✓

       $1500 = \dfrac{D}{5}$✓✓
            D = 7500 m ✓   (4)

[11]

QUESTION 5

5.1   Light behaves as a wave✓ and as a particle ✓   (2)

5.2
       5.2.1   Ultraviolet ✓   (1)
       5.2.2   Radio waves ✓   (1)

5.3   Causes skin cancer ✓   (1)
                      ✓
5.4

       $E = \dfrac{hc}{\lambda}$ ✓

       $= \dfrac{(6,63 x 10^{-34})(3 x 10^{8})}{(700 x 10^{-9})}$ ✓ ✓

       $= 2,84 x 10^{-10}$ J ✓

                                      (5)

5.5   Increases✓. Energy is inversely proportional to wavelength ✓   (2)

[12]

QUESTION 6

6.1

$$n_e = \frac{Q}{Qe} \checkmark$$

$$30 = \frac{Q}{1{,}6 \times 10^{-19}} \checkmark$$

$$Q = -4{,}8 \times 10^{-18} C \checkmark$$

(3)

6.2.1 Total charge in an isolated system remains constant. ✓✓   (2)

6.2.2 Both spheres carry identical charges✓   (1)

6.2.3

$$Q_{new} = \frac{Q_1 + Q_2}{2} \checkmark$$

$$= \frac{(6{,}4 x 10^{-18}) + (-4{,}8 x 10^{18})}{2} \checkmark$$
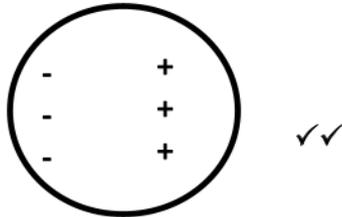
$$= 8 x 10^{-19} C \checkmark$$

(3)

6.3.1 The number of electrons is equal to the number of protons ✓✓   (2)

6.3.2

 ✓✓

(2)

[13]

QUESTION 7

7.1 Reading across the terminals ✓ of a battery when current flows in the circuit ✓   (2)

7.2 $V = \frac{W}{Q}$ ✓

$$= \frac{3 \times 10^4}{2{,}5 \times 10^3} \checkmark$$

$$= 12V \checkmark$$

(3)

7.3   0,97 A ✓✓   (2)

7.4   GREATER THAN✓   (1)

7.5   emf ✓   (1)

[9]

TOTAL MARKS: [75]