**FORM FOUR END OF TERM 2 2022 EXAMINATION**

**Kenya Certificate of Secondary Education (K.C.S.E)**

**232/1**

**PHYSICS**

**PAPER 1**

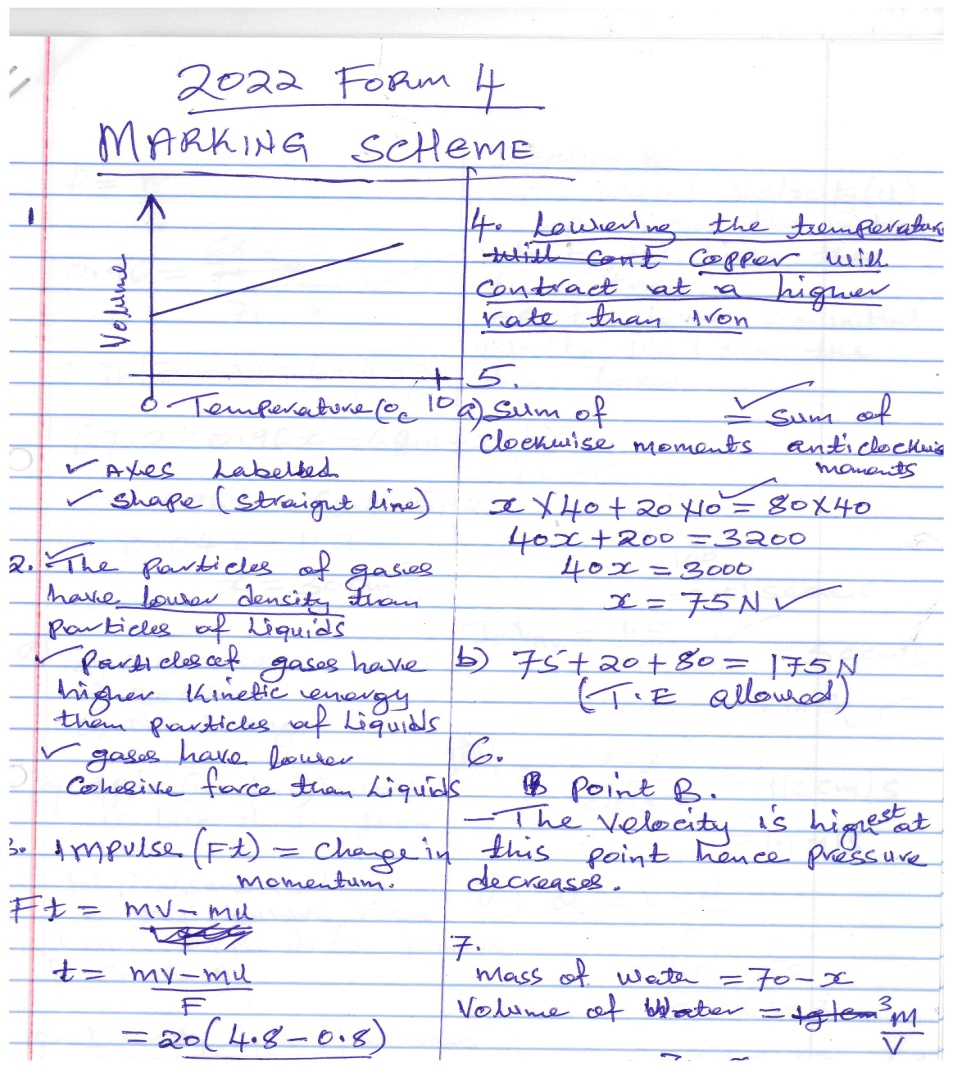
**MARKING SCHEME**

**FORM 4 2022**

**PHYSICS PAPER 1**

**MARKING SCHEME**

**SECTION A**



Axes labelled (1 mk)

Shape (straight line) (1mk)

1. - The particles of gases have lower density than particles of liquids.

- Particles of gases have higher kinetic energy than particles of liquids.

- Gases have lower cohesive force than liquids.

**Any two**

1. Impulse = change in momentum

Ft = mv – mu (1mk)

t =

= (1mk)

= 32 seconds (1mk)

1. - Lowering the temperature(cooling) at the joint (1 mk)

- Copper will contract at a higher rate than iron. (1mk)

1. . a) sum of clockwise moments = sum anticlockwise moments (1mk)

X x 40 + 20 x 10 = 80 x 40 (1 mk)

40X + 200 = 3200

40X = 3000

X = 75N (1mk)

b) Sum of Upward forces=sum of downward forces at equilibrium

75 + 20 + 80 = 175 N (1mk)-*Transfer of error allowed*)

1. point B (1mk)

- The velocity is highest at this point hence pressure decreases. (1mk)

1. mass of water = 70 – x

Volume of water =

=

= 70 - x

Volume of liquid L = 70 – x (1mk)

ρ =

0.96 = (1mk)

0.96(70 – x) = 68.4 – x

67.2 – 0.96x = 68.4 – x

X – 0.96x = 68.4 – 67.2

0.04x = 1.2

X = 30 cm3 (1mk)

1. a) Decrease (1mk)

b) Decrease (1mk)

c) No change. (1mk)

1. a) air (in the) bubble is less dense than water. (1mk)

b) Pressure reduces as the bubble rises due to decrease in liquid depth hence expands (temperature is constant) (1mk)

1. - Density lowers/decreases (1mk)

- Mass remains constant (1mk)

**SECTION B**

1. a) – initial velocity (U) (1mk)

- The higher the initial velocity, the higher the time taken. Or the lower the initial velocity, the lower the time taken. (1mk)

b) i) T =

=

= 0.01 seconds

1. VAB = (1 mk)

= 50 cm/s (1mk)

OR 0.5 m/s

1. VCD = ( 1mk)

= 110 cm/s

OR 1.1 m/s

ii) a =

= 666.67 cm/s2

OR 6.667 m/s2

c) i) a =

= (1mk)

= - 25 m/s2 (1mk)

ii) S =ut + ut + ½ at2 (1mk)

= 0.1 X 100 + 100X 4 – ½ X 25 X 4 X 4(1mk)

= 10 + 200

= 210 m (1mk)

1. a) For a helical spring or any other elastic material the extension is directly proportional to applied force provided the elastic limit is not exceeded.(1mk)

b) – number of turns per unit length. (1mk)

- Diameter of the spring. (1mk)

***Note: Other factors already stated in the stem of the question***

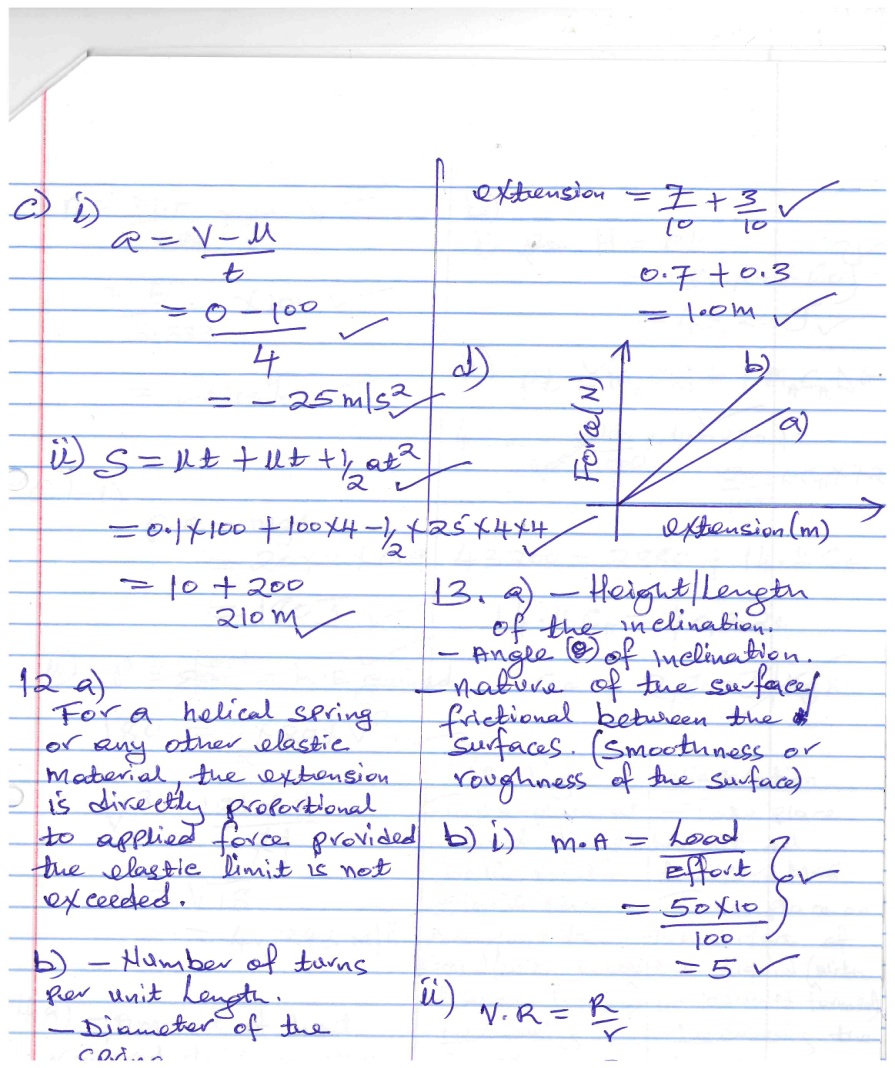
c) F= ke (1mk)

extension = + (1mk)

= 0.7 + 0.3

= 1.0 m (1mk)

d)



1. a) – height/length of the inclination or Angle (θ) of inclination

- Nature of the surface/friction between the surfaces. (Smoothness or roughnessof the surfaces)

**Any two**

b) i) M.A =

= (1 mk)

= 5 (1mk)

ii) V.R =

= (1mk)

= 8.333 ( 1mk)

iii) n = X 100 ( 1 mk))

= X 100 (1mk)

= 60.00% ( 1mk)

c) i) P.E = mgh

= 20 X 10 X 0.9

= 180 J ( 1 mk)

ii) P.E lost = K.E gained ( 1mk)

180 = ½ X 20 X V2 ( 1mk)

V2 =

V = 18

= 4.243 m/s (1mk)

1. a) Amount of heat required to raise the temperature of a given mass of a substance by one degree Celsius or one kelvin. (1mk)

b) i) H = pt

= 180 X 4 X 60 ( 1 mk)

= 43,200 J ( 1mk)

ii) pt = mc X cc X ∆θ + mA X cA X ∆θ

( 1mk)

43,200 = X 400 X 72 + X cA X 72 ( 1mk)

43,200 = 2880 + 14.4 cA

14.4 cA= 40,320

CA= 2,800J/kgK ( 1mk)

c)

|  |  |
| --- | --- |
| **BOILING** | **EVAPORATION** |
| Takes place at a fixed temperature | Takes place at all temperatures |
| Takes place throughout the liquid (with bubbles of steam formed) | Takes place on the surface of the liquid (with no bubbles formed) |
| Decreasing atmospheric pressure lowers the boiling point | Decreasing atmospheric pressure increases the rate of evaporation |

**Any two**

d) – making the bore narrower

- making the wall of the bulb thinner

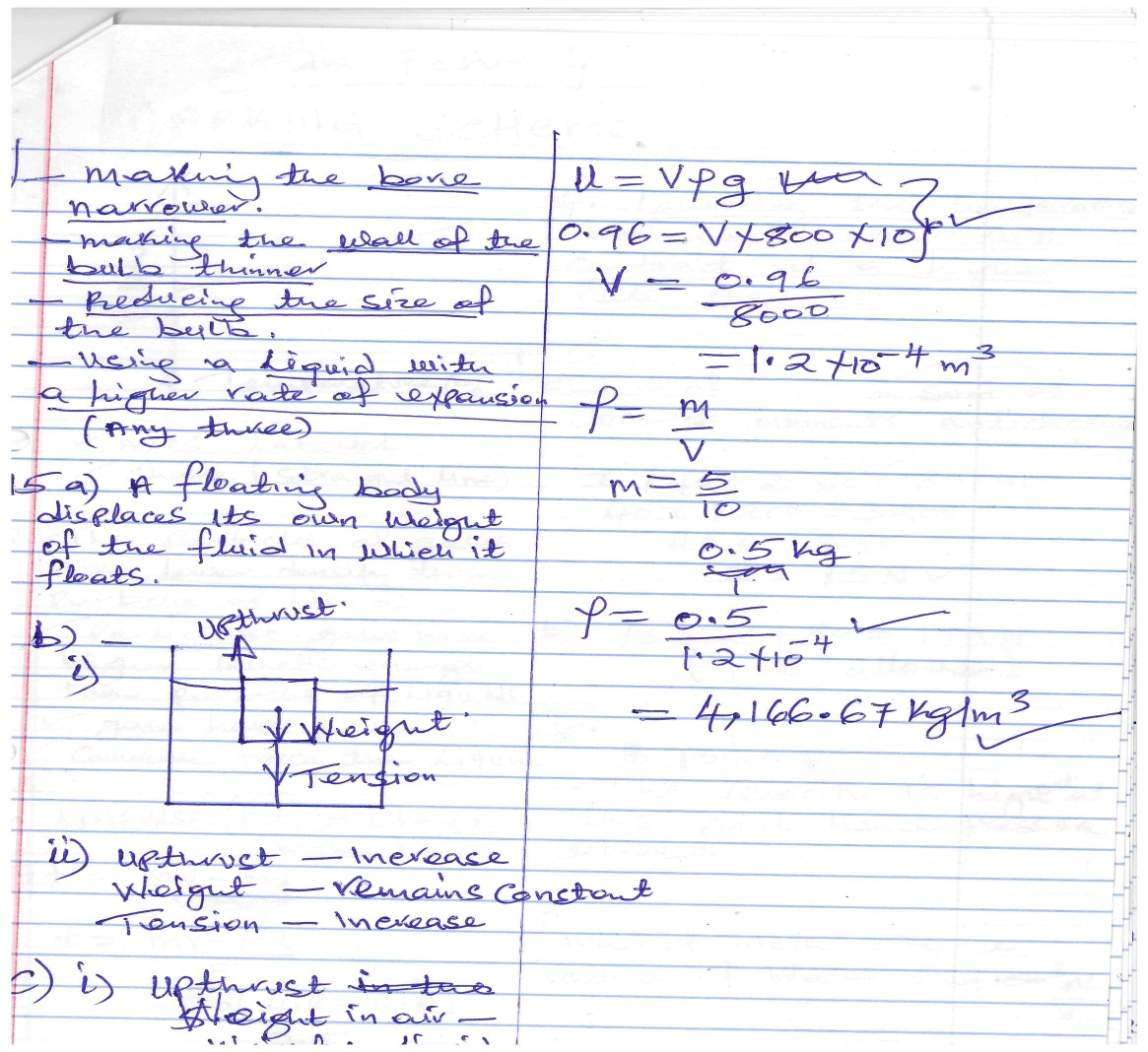
- increasing the size of the bulb

- using a liquid with a higher rate of expansion

**Any three**

1. a) a floating body displaces its own weight of the fluid in which it floats. (1mk)

b) i)



ii) - Upthrust - increase (1 mk)

- Weight- remains constant (1 mk)

- Tesion - increase (1mk)

c) i) Upthrust = weight in air - weight in liquid

= 5.0 – 4.04

= 0.96 N (1mk)

ii) U = Vρg

0.96 = V x 800 x 10 (1mk)

V =

= 1.2 X 10-4 m3

ρ =

m =

m =

= 0.5 kg

ρ = ( 1 mk)

= 4,166.67 kg/m3 (1 mk)