FORM FOUR CLUSTER KCSE MODEL 7

PHYSICS PAPER 1 ANSWERS

SECTION A (25 Marks)

Answer all the questions in this section in the spaces provided.

1. Used to break the intermolecular forces keeping the ice molecules together.√ (1 mk)

2. Molecules collide with the walls of the syringe, results into change of momentum, hence force on the wall .

3. $PV = \text{constant}\surd$

$100\ 000 \times 150 = 120 \times P$

$P = \frac{100000X150}{120}$

$= 125\ 000\ Pa.\surd$

4. The paper carried downwards;√ faster moving air below causes reduction in pressure below the paper;√

5. Diameter of the spring.

Thickness of the wire used.

Length of the spring.

Type of wire used. (only 2

6. Kinetic energy -potential energy 7.

$M_sV_s + M_bV_b = 0\surd$ Or substition.

$50 \times 3 + 300x - V_b$

$V_b = \frac{50x3}{300}$

$= 0.5m/s\surd$

8. $Pg = Pa - h+g \quad \surd$ or (pressure due to mercury column h +g)

$Pg = 103360 - 0.005 \times 13600 \times 10\surd$

$= 102680NM^{-2}\surd$

9. Resultant force = 20-12

$= 8N\surd$

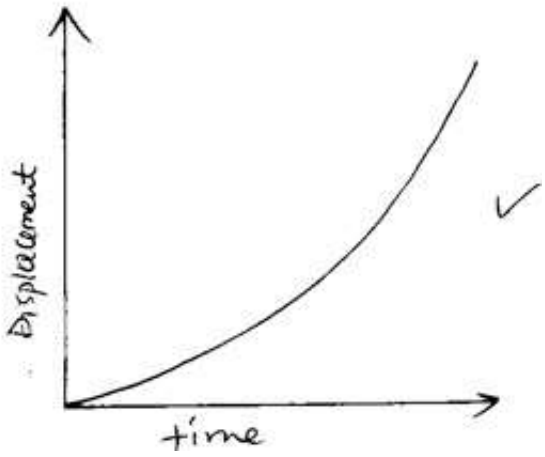
$F = Ma$

$a = \frac{8}{2}\surd$

$= 4m/s\surd$

10. Paraffin has a lower specific heat capacity.

11. **11.**



12. a is more stable√ Broader base and the lines o action of weight cannot easily fall outside the base.

13. Effective spring constant

$$1/ke = \frac{1}{6} + \frac{1}{4}\surd$$

$$Ke = \frac{12}{5} = 2.4N/cm\surd$$

14.

$$F = ke$$

$$e = F/K = \frac{15}{2.5}\surd$$

$$= 6.25cm\surd$$

SECTION B (55 Marks)

15. (a). Determine the heat supplied from the surrounding.

(b). $M = 63 - 24 = 39g$

(i). $M_i L_f =$ Heat supplied √

$$(63-24)\,L_f = 17160$$

$$L_f = \frac{17160}{39}$$

$$= 440.00J/g$$

$$= 440000J/kg \quad \surd$$

(ii). Not all the head from the heater goes to melting the ice.√
(c). Kinetic energy remain constant
(d). Evaporating water draw latent heat of vaporization from the milk mantany it at low temperatures.

16. . a.(I) F =ke

$5 = (0.16 - lo)k$

$10 = (0.20 - lo)\ k$

$$\frac{0.20 - lo}{0.16 - lo} = \frac{10}{5}$$

$0.32 - 2\ lo = 0.20 - lo$

$Lo = 0.12m$

$= 12\ cm$

(II). $8 = k(1 - 0.12)$

$$K = \frac{5}{0.04} = 125N/m\sqrt{}$$

$8 = 125L - 15\sqrt{}$

$$L = \frac{23}{125}$$

$= 0.184m.$

$=184mm.\sqrt{}$

$F_s = 125 \times 0.18$√

$= 22.5N$√

$F_1 d_1 = f_2 d_2$√

$W_1 \times 0.3 = 22.5 \times 1.2 = 22.5 \times 1.2$√

$$W_1 = \frac{22.5X1.2}{0.3}$$

$= 90N$√

17. (a). 5 (equal to the number of string supporting the load)

185 ± 5N √√ must be shown on the graph.

$$M.A = \frac{535}{185}\sqrt{}$$

$$\eta = \frac{M.A}{VR} X\ 100\ \sqrt{}$$

$$= \frac{535}{185x5} \times 100 = 58\%\sqrt{}$$

(d). Pulleys have friction in their bearings. (1mk)
Effort wasted in raising addition weight of strings and pulleys.√ (1 mk)
Friction increases with increasing load.

(e). Maximum M.A $= \frac{755}{215}\sqrt{}$

$= 3.511N\sqrt{}$

18. .(a) Angular displacement $:= \frac{1}{4} 2\pi\sqrt{}$

(b). Angular velocity $\frac{\pi}{2}$ radians√

$= 2 \times 3.142 \times 3\sqrt{}$

$=18.852$ rads $^{-1}\sqrt{}$

(c). Centripetal force $= mrw^{-2}$ √

$= 0.25 \times 1.5 \times 18.852$√

$= 7.0695$N√

(d). (i). $V = rw$

$= 1.5 \times 8.85^2$

$t = s/v$

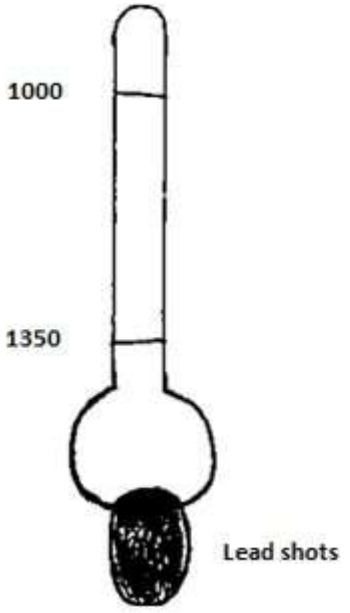
$= \frac{50}{1.5x18.852}$ √ $= 1.77$ sec√

(ii). $S = ut + ½ gt^2$

$= 0 + ½ + 10x1.77^2$√

$= 15.63$m√

19. .(a)



√√density at correct depths (scale) 2mks

(b)(ii). The wooden rod is put in water to float vertically and the floating depth marked 1000√

-The same wooden rod is placed in paraffin and the floating depth makes 800.

-The length between the two marks is divided and a scale developed to measure densities of liquids.√1mk

(ii). To make it float vertically in the liquids.

(i). $u = \frac{3}{4} \times \frac{200x1000x10}{1000000} \times 10$√√

= 1.5N.

(ii). $\rho = \frac{m}{v} = \frac{150}{200}$ √ = 0.75g/cm^3√

(iii). Force = upthrust expected√ - weight of wood

$= \frac{200x1000x10}{1000000} - 1.5$√

$= 2 - 1.5$

$= 0.5$N√