232/1 PHYSICS PAPER 1

KIJISET 2022 MARKING SCHEME

SECTION A

1. Main scale reading = 3.20 cm

Vernier scale reading = 0.05 cm ✓1 for both readings

Reading on the scale = 3.25 cm. ✓1

1. Match sticks moves away from each other ✓1

Soap solution weakens surfaces tension in between hence stronger force on pulls them outwards ✓1

1. P=F∆V✓ =3.5×(6.0-3.5) = 8.75W✓
2. a) By strongly illuminating a suspension of pollen grains in water/dust particles in air or smoke cell ✓1

b) A body continues in its state of rest or motion with uniform velocity unless acted upon by an external force ✓1

5. The energy possessed by gas molecules increases with increase in temperature ✓These causes an increase in intermolecular distance ✓

6. Diameter of the wire; ✓Number of turns per unit length;✓ Diameter/thickness/radius of the wire;✓ Length of the spring; ✓Nature of the material of the wire.✓ Any two

7. Water particles has spaces between them.(the intermolecular spaces )

Potassium Permanganate particles spread through diffusion and occupies these spaces making the whole liquid colored

8. Volume =✓ =✓

9.



10. 







11. Neutral

12. (2.53 + 0.50) sec = 3.03 sec;

SECTION B

13. (a) The direction of velocity of the moon keeps on changing due to the changes in direction moon as it revolves around the earth.

 (b) (i) = 2🗸 1mk = 2 x 3.142 x 6 = 37.704 rad/s 🗸 1mk

 (ii) a = = r = 37.7042 x 0.6 = 852.955m/s2🗸 1mk

 (iii) T = Fc = mrw2 🗸 1mk

 = 0.045 x 0.6 x (37.704)2 = 38.38N 🗸 1mk

 (iv) v = wr = 0.6 x 37.704 🗸 1mk = 22.62m/s

(c) (i) Slope = = 2000N/kg 🗸 1mk

 (ii) 🗸 1mk

 = 0.2 x 2000 = 400N 🗸 1mk

 (iii) Centripetal force 🗸 1mk

 14. (a)



 (b) (i) V.R =Number of the ropes supporting the load = 6

(ii)

* Efficiency of the pulley system.

(iii) Wasted effort=

 Wasted effort = Weight of lower block +Frictional Force

 Weight of lower block =50.04-3.6N=46.44N

(c) Load

(d)

15. a)A floating object displaces its own weight of fluid in which it floats.

b) (i) T=U-mg or W+T=U

(ii) Weight of block = Volume of block x density of block x g

 = 0.50 x 0.40 x 0.20 x 600 x 10

 = 240N

(iii) Volume of water displaced = 0.5x0.4x0.2 m3

 Mass of water = 0.5 x 0.4 x 0.2 x 1000

 Weight of water = 400N

(v) T= U-W

 =400-240

 =160N

16. (a)

(i) *Measurements that should be taken in the experiment*

-Length of column of dry air (½ mark) -Temperature (½ mark)

-Length/ height of the mercury thread (½ mark) -Volume of air (½ mark)

(ii) *How the measurements taken are used to verify Charles’ Law*

Temperature is varied and values of Length and Temperature are measured and recorded (½ mark); a graph of Length versus Temperature is plotted (½ mark). This is a straight line cutting T axis at O (A) (½ mark) (or – 2730C) since tube is uniform Length α Temperature. (½ mark)

iii) *Determine the Volume*

P1V1 = P2 V2 (½ mark) = 1.5.x 105 x 1.6 = 1.0 x 105 x V2 (½ mark)

 T1 T2 285 273

 = V2 = 23m3 (1 mark)

(b)

(i) *Time taken for all the ice to be just melted*

Vit = mlf, 250 x 4 x t = 1 x 3.34 x 105, ✓1

 t =  t = 334 seconds or 5 minutes 34 seconds✓1

(ii) *Time taken until half the contents of the kettle get boiled away*

Vit = mlf + mwcw∆θ + ½ mlv, (½ mark)

250 x 4 x t(½ mark) = 3.34 x 105 + 2 x 4200 x 100 + 1 x 2.26 x 106 ✓1

 t =  t = 3434 seconds or 57 minutes and 14 second ✓1

17. a (i) OA- Uniform acceleration✓

 (ii) Decreasing acceleration✓

b (i) h=✓

 0.1= 5t2

 t= 0.1414s✓

 (ii) R = ut✓

 = 2x0.1414= 0.2828m✓

 (iii) I) u=

 II) v =✓

 III) a

 ✓