232/1

**PHYSICS**

Paper 1

July/August 2016

**MARKING SCHEME**

1. V1 = 92 cm3 AND V2 = 140 cm3.

V = 140 – 92 = 48 cm3

D = m/v

567g/48 cm3

11.8125g/cm3

11812.5kg/m3

1. It tilts to the side with wood because when metal is heated it expands and becomes lighter.
2. (a)T= v/A

 = 6 x 10-10

* + 1. x (0.16)2

= 7.459 x 10- 9 m

(7.45942075 x 10- 9m)

1. The molecules in oil patch are closely packed. The oil drop b a perfect sphere/the oil patch perfect circular.
2. Pt = mc∆$θ$

180 x 7.5 x 60 = 2 x c x 40

c = 1012.5J/kgk

1. Impurities
2. Sum of clockwise moments = sum of anticlockwise moments

(5 x 50) + 35W = 30 x 30

W = 18.57 N.

1. Initially the air above the graze has not reached the ignition temperatures after sometime the heat from the gaze raises the temperature above it to its ignition temperature.
2. Fluid B is less viscous compared to A or A is more viscous than fluid E
3. P=Fv

2000 x 12 =24000w

 V (m/s)

 t/(s)

1. Convection- having a vacuum between double walls

Radiation – shinny/ silvery walls

1. Mass per

Unit volume

(g/cm3)

 40C Temperature (0C)

1. Increase in velocity of moving fluid is accompanied by a decrease in pressure
2. V2 >V1> V4>V3
3. Spring constant for the three springs in parallel Kp = 3 x 300 N/m = 900 N/m

 e1= $\frac{F}{Kp}$

 e1= $\frac{90 N}{900 N/m}$ = 0.1 m

 Spring constant for the two springs in parallel Kp = 2 x300 = 600 N/m

 e2 = $\frac{90 N}{600 N/m}$ = 0.15 m

 total extension = 0.1 + 0.15 = 0.25 m

**SECTION B**

16.

1. M.A =$\frac{l}{e}$ =$\frac{800 N}{200 N}$

 = 4

1. E = $\frac{M.A}{V.R}$ × 100%

E =$\frac{4}{5}$ × 100%

E = 80 %

1. P =$ \frac{effort ×effort distance}{time taken}$

 = $\frac{200 ×0.6}{15}$

 = 8 W

1. (i) Energy is lost to raise lower parts of the machine;

(ii) Work is done against friction.

17.

 (a) Spreading of particles from a region of high concentration to a region of low

concentration.

 (b) Bright specks of light in constant random motion are seen.

Smoke particles collide with air particles that are in constant motion which make them change their direction of motion and hence move randomly.

 (c) (i) To give enough time for the salt to dissolve to prevent displacement of

water.

 (ii) Particles of salt enter into spaces between larger water particles.

 (d) (i) Ammonia gas particles diffuse faster than acid gas particles.

(ii) The smaller the size of particles and the smaller the mass, the faster the rate of diffusion.

(iii) It takes longer time because the kinetic energy of particles is reduced i.e particle move at a lower speed.

18.

(a) (i) At B the radius of the bend is small, therefore more centripetal force is required to maintain the minibus

 along the path than at point A hence skidding may occur if the frictional(centripetal) force is not

 sufficient.

 (ii) V = $√$rgtan$θ$

 V = $√$250 $×$ 10 tan 200

 V = 30.16m/s

(b) (i) T = $\frac{1}{f}$

 = $\frac{1}{5}$

 = 0.2 s

(ii) $ω$ = 2$π$f

 = 2 × 3.142 × 5

 = 31.42 rad/s

19.

(a)

**Balance reading (N**)

**Depth (m)**

1.

**Upthrust (N)**

 **Depth of immersion (m)**

 (b) (I) FL = (h$ρ$g)A

 FL = (0.3 $×$ 800 $×$ 10)$ ×$ (0.1 $×$ 0.15)

 FL = 36 N

 (II) F T = (h$ρ$g)A

 FT = (0.1 $×$ 800 $×$ 10) $×$ (0.1 $×$ 0.15)

 FT = 12 N

 (c) Upthrust U= (36 -12)

 U = 24 N

 (d)Weight of the block =$ρ$ $×$ V $×$ g Balance reading = true weight – upthrust

 = 3000 $×$ (0.1 $×$ 0.15 $×$ 0.2) $×$ 10 = 90 N – 24 N

 = 90 N = 66 N

20.

 (a) Inertia is tendency of a body to resist change of motion.

 (b) (i) in elastic collision both momentum and kinetic energy is conserved.

 (ii)

 4m 600

 4 m

 h

 Cos 60 = $\frac{Ad}{4}$

 Adj = 4 cos 600

 = 2 m

 h = 4 – 2 = 2m

 (iii) h = $\frac{1}{2}$gt2

 3 = $\frac{1}{2}$x10t2

 $\frac{3}{5}$ =t2

 t2 =0.6

 t = 0.7746 s

 (iv)

 ½ mv2=mgh

 V2=2gh

 

 =

 =6.3246m/s

 (v) S=ut+ ½ gt2

 S = ut

 S = 6.3246 x 0.7746

 S = 4.899 m

1. This will reduce the impulsive force by increasing the time of contact or impact into ground.