**231/1**

**phy PAPER 1**

**FORM 4**

**TIME: 2HRS**

**Marking Scheme**

|  |  |  |
| --- | --- | --- |
|   |  Main scale + vernier Scale + error2.5 + 0.04 + 0.05 = 2.59 |  |
|  | mass of the liquid = 12 – 6 = 6 gvolume of the liquid = 9 cm3density of the liquid = 6/9 = 0.6667 g/cm3 |  |
|  | Gas pressure = atm pressure + hpg= $0.76 ×13600 ×10+0.1 ×1000 ×10$$$=103360+1000=104360N/M$$ |  |
|  | Mass of the object = $\frac{49}{9.8}=5 kg$Acc due to gravity =$ \frac{40.5}{5}=\frac{8.1N}{kg}$ |  |
|  | mater is made up of many tiny particle. Small particles of salt fit in between molecules of water when dissolving |  |
|  | The thermometer in CThe rate of conductivity of heat increases with cross-sectional area. |  |
| 1.
 | Boiling water would burst the clinical thermometer |  |
|  | $$0.2 ×10=w ×40$$$$w= \frac{0.2 ×10}{40}=0.5N$$Total weight = $\frac{2000}{1000}+0.5$$$2+0.5=2.5N$$$$tension=2.5 N$$ |  |
|  | the molecules of the air above the car moves at high velocity therefore lowering the pressure above the vehicle |  |
|  |  |  |
|  | to make and break contact of the circuit. The strip bends and straiten when the metal contract or expand at different temperatures. ii) When the switch is closed, current flows through the heater and warm air in the room, thus heating the strip, the strip bends away from the contact . This disconnect the heater, when the strip cools down, it reconnect and the process repeat itself. |  |
|  | Section B |  |
| 1. (a)

(b) (i)   (ii) I)  (II)(C) (i)(ii) | The velocity is the ration of effort distance to that of load distance.V.R = $\frac{1}{\sin(30)}= \frac{1}{0.5}$= 2$$effeciency=\frac{M.A}{V.R} ×100$$$$75= \frac{M.A}{2} ×100$$$$M.A= \frac{75 X 2}{100}$$$$=1.5$$$$M.A= \frac{L}{E}$$$$1.5=\frac{L}{E}$$$$1.5= \frac{800}{E}$$$$E=\frac{800}{1.5}=533.33n$$This due to inertia, the object tends to continue in uniform motion in a straight line$$S=\frac{1}{2}gt^{2} S=0.2+3.2=3.4m$$$$3.4=\frac{1}{2} ×10t^{2}$$$$t^{2}=0.68, t=0.8246 seconds$$ |  |
| 1. (a)

 (b)   | Hooke’s law states that force applied to an elastic material is directly proportional to the extension provided elastic limit is not exceeded.F = ke0.2N = K $×0.1$$$K= \frac{0.2}{0.1}=\frac{2N}{M}$$$$F=2×0.15$$$$F=0.30 N$$$$=0.03kg or 30g$$ |  |
|  1. (a)

(b) (c) (ii)  (iii) (d)  | When a body is partially or totally immersed in a fluid, it experiences an up thrust equal to weight of the fluid displacedBalloons/ships (explain any one)C:\Users\Ruiga Day\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.Word\IMG_20201126_085122_034.jpgT = upthrust – weightVolume of air displaced = 2000m3Upthrust = 2000 X 1300 X 1026 X 106 NWeight of balloon + helium(2000 X 0.18 X 10) + (500 X 10) = 86007 = 26 X 106 – 8600= 25991,400NF = Ma = resultant force25991400 = (500 + 360)aA = 30,222.56ms2To displace large volumes of the liquid hence provide sufficient upthrust. |  |
| 1. (a) (i)

 (ii) iii)(c)  | Tension in the spring supporting the objectThere is change in the direction of instantaneous velocity at various points along the circular pathThe object moves tangentially to the circular path at that point where it cuts.Reading of spring balance = centripetal force$$\frac{MV^{2}}{V}$$$$81= \frac{0.5 X V^{2}}{0.5} V^{2}=81$$$$ V=9M^{-S}$$ |  |
| 1. (a)

(b)(i)  (d) (c) | The pressure of a fixed mass on an ideal gas is directly proportional to the absolute temperature provided the volume remains constant.$$\frac{I}{V}=55$$$$v= \frac{1}{55}$$$$V=0.01812cm^{3}$$Increase in temperature causes molecules to move faster causing more number of collisions with the wall of the cylinder, for pressure to remain constant volume must increase  |  |

17 a) the quantity of heat required to raise the temperature of a unit mass of a substance by 1 degree Celsius or by 1 kelvin.

b ) i) Q = MLv

 0.1 x 2 2600 000 = 226 000 J

ii)Q = MLv + MC x change in temperature = 22600 + 0.1 x 4200 x 50 = 247 000J

iii) 247 000 = m x 4200 x 23

m = 2.557 kg