**MARKING SCHEME**

**PHYSICS PAPER 1 FORM 4 TERM 2 2024**

**SECTION A – 25 MARKS**

1. 12.5

+ 0.23 √

12.73– 0.03 = 12.70mm √

Centripetal force

 Weight Reject symbols of the forces.

1. (i) Nature/ type of the material. √

(ii) Cross-sectional area of the conductor. √

(iii) Temperature difference. √

Any 2 correct

1. F = ke

e1 + e2 = F1 + F √

k 2k

 0.045= $\frac{12}{k}$ + $\frac{12}{2k}$ √

 0.045 = $\frac{24 +12}{2k}$

 0.09k = 36

 k = 400N/m √

1. 50×0.15 = 7.5cm3√

40.6 – 7.5 = 33.1cm3√

1. Lung pressure = Pa + hρg √

= (1.03×105) + $\frac{50}{100}$ × 1000 × 10 = 108000N/m2 √

1. Increase in temperature increases the kinetic energy of the particles. **√**
2. - Making it wider at the base. √
* Making the base heavier. √
1. There is lower pressure √ above the car due to the higher velocity. Thus the higher atmospheric pressure √ from beneath lifts the car making it feel lighter.
2. The pull of gravity √ is different for the two planets.
3. a) Elastic collision - Collision where both momentum and K.E are conserved.

 Inelastic – Collision where momentum only is conserved.

b) M1V1 = M2 V2

 0.05 × V = (0.05×1.5) + (0.5×0.5)

 0.05V = 0.075 + 0.25

 V = 0.325

 0.05

 = 6.5m/s

**SECTION B: 55 MARKS**

1. Quantity of heat energy required to change a unit mass of the substance from solid to liquid without change in temperature.

b) (i) Q = MLV √

 100 × LV

 100

 = 0.1LV √

 (ii) Heat lost = MCDQ

 = 0.1 × 4200 × (100 – 48.8) = 21,504J

 (iii) Heat gained = (2×4200×28.8) + (0.5×400×28.8) = 241,920 +5760

 = 247,680J

 (iv) 0.1LV + 21,504 = 247,680

 0.1LV = 247,680 – 21,504

 0. 1LV = 226,176 = 2.262 ×106J/kg

 0.1 0.1

1. a) Distance is the length between two fixed points while displacement is the length between two fixed in a specified direction. √

b) i. The velocity is decreasing. √

 ii. $\frac{1}{50}$ = 0.02 seconds √

 iii. V = $\frac{s}{t}$ = $\frac{2.5}{0.02}$ √

 = 125cm/s or 1.25m/s √

 iv. $\frac{0.5}{0.02}$ = 25cm/s or 0.25m/s √

 v. a = $\frac{v-u}{t}$ = $\frac{25-125}{0.02×5}$ = $\frac{-100}{0.1}$ = -1000cm/s2  = -10m/s2  √

c) h = $\frac{u^{2}}{2g}$ = $\frac{6×6}{2×10}$ = 1.8m √

1. a) i) V.R = $\frac{Effort distance}{Load Distance}$

 = $\frac{20}{5}$ √

 = 4 √

ii) $\frac{M.A}{V.R}$× 100% = 80% √

 M.A = 80×4 = 3.2 √

 100

iii) M.A = L

 3.2 = $\frac{500N}{E}$ √

 E = 156.25N √

iv) Work is done to overcome friction. √

b) i) Volume of liquid leaving small piston = Volume of liquid getting into larger piston.

 distance at A × πr2 = distance at B × πR2 √

 V.R = $\frac{Distance A}{Distance B}$ = $\frac{πR^{2}}{πr^{2}}$ √

 V.R = $\frac{R^{2}}{r^{2}}$ √

 ii) M.A = $\frac{L}{E}$

 100 = $\frac{L}{7}$ √

L = 100×7 = 700N √

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

b) i) Volume of liquid displaced = Volume of the body.

 V = $\frac{m}{ρ}$

 = $\frac{10kg}{4000kg/m^{3}}$

 = 0.0025m3

 ii) Upthrust = Vpg

 = 0.0025 × 800 × 10

 = 20N

 iii) 100 – 20 = 80N

 F1d1 = F2d2

 2M = 4×80

 M = 160N = 16kg

 10

1. a) A gas whose both volume of molecules and forces between the molecules are negligible and obeys gas laws perfectly.

b) (**Graph)**

 i) Boyles law.

ii) Mass

iii) P =(K) 1/V

K = gradient

gradient = $∆P$ = 4.0 – 0 × 103 pa = 8.333 × 10-4pa m3

 $∆1/V$ 4.8 – 0 × 106 m-3

must have units

follow through candidate’s work

c) Measure and record the initial temperature and its corresponding height (volume). √

 Measure and record several values of temperature and their corresponding heights. √

 Plot a graph of volume against absolute temperature. √

 A straight line passing through the origin is obtained verifying Charles’ law. √