

FORM 3 PHYSICS
PAPER 1 MARKING SCHEME
TERM 3 2026

$$\begin{array}{r} 4.5 \\ + .42 \\ \hline 4.92 \\ - .09 \\ \hline 4.83 \text{ mm } \checkmark 1 \end{array}$$

2. The large mass M persists in maintaining its state $\checkmark 1$ of rest (or inertia), hence thread B cuts.
3. $F = ke \checkmark 1$
 $e = \frac{1}{2} (\frac{10}{2}) + \frac{10}{2}$
 $= 2.5 + 5$
 $= 7.5 \text{cm } \checkmark 1$
4. Sum of clockwise moments = sum of anticlockwise moments $\checkmark 1$
 $(5 \times 50) + 35w = 30 \times 30 \checkmark 1$
 $250 + 35w = 900$
 $w = 18.57 \text{N } \checkmark 1$
5. It tilts to the side with wood $\checkmark 1$, because when the metal is heated, it expands and becomes lighter $\checkmark 1$.
6. Convection – having a vacuum between the double walls. $\checkmark 1$
Radiation – shiny / silvery walls $\checkmark$
7. Adhesion $\checkmark 1$
8. Smoke particles collide with air molecules which are moving in the same random manner. $\checkmark 1$
9. On heating, the flask expands first $\checkmark 1$ and water drops to occupy the space created. Level starts rising as water expands more $\checkmark 1$ than the flask or liquids expand more than solids.
10. Volume of drop $\checkmark =$ volume of circular patch
 $5 \times 10^{-6} = \frac{22}{7} \times (1.4 \times 10^{-1})^2 t$
 $t = 8.12 \times 10^{-5} \text{m } \checkmark$
11. Fluid B is less viscous compared to A $\checkmark 1$ OR
A is more viscous than B.

12. (i) OA – Uniform acceleration $\sqrt{1}$
(ii) AB – Zero acceleration $\sqrt{1}$ OR
Lift moving with uniform velocity
13. Area under the curve = distance $\sqrt{1}$
 $= \frac{1}{2} \times 15 (5 + 20) \sqrt{1}$
 $= 187.5\text{m} \sqrt{1}$
14. Because of higher $\sqrt{1}$ adhesive force than cohesive force $\sqrt{1}$

SECTION B

15. (a) Streamline flow – steady flow of a fluid $\sqrt{1}$
Turbulent flow – disorderly flow of a fluid $\sqrt{1}$
(b) Pressure over the roof and between the walls was greatly reduced $\sqrt{1}$ by the fast moving wind $\sqrt{1}$
- (c) (i) $A_1 V_1 = A_2 V_2 \sqrt{1}$
 $2.5 \times 450 = 40 \times V_2$
 $V_2 = \frac{2.5 \times 450}{40} = 28.125\text{cm/s} \sqrt{1}$
(ii) End x $\sqrt{1}$, high pressure $\sqrt{1}$
- (d) (i) Water rose through the tube $\sqrt{1}$
(ii) High speed air reduced the pressure in the tube thus water rose up $\sqrt{1}$
16. (a) (i) Initial momentum $= (\frac{30}{1000} \times 200) + (\frac{970}{1000} \times 0)$
 $= 0.03 \times 200$
 $= 6\text{kg ms}^{-1} \sqrt{1}$
Final mom $= (0.03 + 0.97)V = 1V$
Initial mom = final mom $\sqrt{1}$
 $6\text{kg ms}^{-1} = 1V$
 $V = 6\text{ m/s} \sqrt{1}$
- (ii) K.E = PE
 $\frac{1}{2} MV^2 = mgh \sqrt{1}$
 $h = \frac{1}{2} \frac{V^2}{g} = \frac{1}{2} \times \frac{6 \times 6}{10}$
 $= 1.8\text{m} \sqrt{1}$
- (b) (i) Pressure due to water = pressure due to liquid A
 $\ell gh = 1 \times 10 \times 16 = \ell \times 10 \times 20$
 $\ell = \frac{10 \times 16}{10 \times 20} = 0.8\text{ g/cm}^3 \sqrt{1}$

$$\begin{aligned}
 \text{(ii)} \quad \rho &= \ell \text{hg (liquid A) } \sqrt{1} & \text{OR} & \quad \rho = \ell \text{hg (water) } \sqrt{1} \\
 &= 800 \times 10 \times \frac{20}{100} \sqrt{1} & & = 1000 \times 10 \times \frac{16}{100} \sqrt{1} \\
 &= 1600 \text{N/M}^2 \sqrt{1} & & = 1600 \text{N/M}^2 \sqrt{1}
 \end{aligned}$$

17. (a) - Rise in temperature given gas molecules more kinetic energy $\sqrt{1}$
 - Collisions between molecules increases $\sqrt{1}$
 - Molecules move further apart in all directions $\sqrt{1}$
- (b) - As the temperature is increased at different intervals, the corresponding pressure is recorded $\sqrt{1}$
 - The results are tabulated
 - The graph of pressure against temperature is plotted $\sqrt{1}$
 - The graph is extrapolated to cut X-axis at 273 $\sqrt{1}$
 - This verifies that pressure varies directly with absolute temperature $\sqrt{1}$

$$\begin{aligned}
 \text{(c)} \quad V_1 &= 250 \text{cm}^3, & V_2 &= ? \\
 P_1 &= 9.5 \text{M}, & P_2 &= P_1 + 15 \\
 & & &= 9.5 + 15 = 24.5 \text{m } \sqrt{1}
 \end{aligned}$$

$$T_1 = T_2$$

$$\begin{aligned}
 \frac{P_1 V_1}{T_1} &= \frac{P_2 V_2}{T_2} \sqrt{1} \\
 \frac{9.5 \times 250}{T_1} &= \frac{24.5 \times V_2}{T_2} \sqrt{1}
 \end{aligned}$$

$$\begin{aligned}
 V_2 &= \frac{9.5 \times 250}{24.5} \\
 &= 96.94 \text{cm}^3 \sqrt{1}
 \end{aligned}$$

18. (a) (i) $E = p \times t \sqrt{1}$
 $= 1000 \times 60 \times 4$
 $= 24000 \text{J } \sqrt{1}$
- (ii) Mass of evaporated water = 178 – 169 = 9g $\sqrt{1}$
 $Q = ML_v = P \times t$
 $24000 = \frac{9}{1000} \times L_v \sqrt{1}$
 $L_v = 2.67 \times 10^6 \text{J/kg } \sqrt{1}$
- (iii) The can conducted some heat to the environment $\sqrt{1}$
 (or heat loss to the environment by the can)
- (b) Heat lost by the metal = heat gained by water
 $0.2 \times C \times (98 - 21) = 0.42 \times 4200 \times (21 - 16) \sqrt{1}$
 $0.2 \times C \times 77 = 8820$

$$C = \frac{8820}{0.2 \times 77} = 572.73 \text{ J/kg} \sqrt{1}$$

$$(c) \quad U = \frac{1.2\text{cm}}{0.025} = 60\text{cm/s}$$

$$V = \frac{4\text{cm}}{0.025} = 200\text{cm/s}$$

$$a = \frac{V - U}{t}$$

$$= \frac{200 - 60}{0.2 - 0.02} \sqrt{1}$$

$$= \frac{140}{0.18}$$

$$= 777.778 \text{ cms}^{-1} \sqrt{1} \quad \text{or} \quad 7.778 \text{ m/s}$$

19. (a) (i) The ratio of the length of the plane to the vertical height $\sqrt{}$

(ii) The ratio of the driven wheel to the driver wheel $\sqrt{}$

(b) Microphone

(c) Loss in k.e = gain in heat energy

$$= \frac{1}{2} mv^2 \sqrt{}$$

$$= \frac{1}{2} \times \frac{20}{1000} \times (400)^2$$

$$= 1600\text{J} \sqrt{}$$

(d) (i) Efficiency = $\frac{V.R}{m.a} \times 100\% \sqrt{}$

$$= 4 \times 100\%$$

$$\frac{80}{20}$$

$$= \frac{4}{4} \times 100\% \sqrt{}$$

$$= 100\% \sqrt{}$$

(ii) Power = $\frac{\text{Work done by effort}}{\text{Time}} \sqrt{}$ or power = $\frac{\text{work done}}{\text{time taken}} \sqrt{}$

$$= \frac{\text{Effort} \times \text{effort distance}}{\text{Time}} \sqrt{}$$

$$\text{L. dist} = 0.6$$

$$\text{E. dist} = 0.6 \times 4$$

$$4 = \frac{x}{0.6}$$

$$x = 2.4$$

$$P = \frac{20 \times 24}{15}$$

$$= \frac{80 \times 0.6}{15}$$

$$= 3.2\text{W} \sqrt{}$$

$$\begin{aligned} &= \frac{48}{15} \\ &= 3.2 \text{ W} \end{aligned}$$

