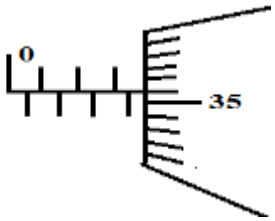
FORM 3 PHYSICS PP1

END OF TERM 3 - 2024

MARKING SCHEME

1.



(i) Lift pump

(ii) - can't lift water to great heights *(max of 10.4 m)*

- leakage

Iii) There is no resultant force, and therefore no acceleration.

2. A) Because of non-uniform expansion of the flask. Should be heated over wire gauze, it distributes heat evenly

b) Mass $= 16.5/1.7 = 9.706\ kg$

3. Diffusion. Particles of the gas move to regions of low gas concentration

4. (i) Are light and visible

(ii) air particles also exhibit constant random motion.

(iii) No difference.

5. – Pollution

- death of aquatic life since the supply of oxygen will be cutoff.

6. Extension of each spring $= 10\ cm$

$K = {}^{20}/_{10} = 2N/cm$

7. Increase base area. This ensures that the vertical line drawn from the center of gravity falls squarely within the base.

8. The paper caves downwards

This is because the fast moving air reduces the pressure beneath causing the high atmospheric pressure above to act on it.

9. (a) (i) Type of collision where the bodies stick together after the collision.

(ii)

(b) $V_R = \frac{0.02\times350}{3.5} = 2\ m/s$

$(c)(i)\ s\ =$ ½ at^2

200 $= 0.5 \times 1 \times t^2$

t = 20 s

(ii) F= ma

$(0.6 - Fr) = 0.2 \times 1$

Fr= $0.6 - 0.2$ =0.4 N

(iii) $\mu = \frac{Fr}{R}$

$= \frac{0.4}{0.2} = 2$

(iv) - weight

10. (a) - is the product of mass and velocity of a moving body
- Si unit: kilograms per square meter.

(b) for a system of colliding bodies the sum of their initial momentum is equal to the sum of thir final momentum

(c) (i) $8 \times 3 = 4 \times v$

$v = 6\ m/s$ to the right

(ii) KE_X = (½ × 3 × 64)= 36 J

KE_Y = (½ × 4 × 36) = 72 J

(d) (i) $0.2v = 2 \times 5$

$v = 50 m/s$

(ii) Ft = change in momentum

F = $\frac{10}{0.2}$ = 50 N

11. a) Height h decreases / reduces

This is because pressure in liquids increase with increase in depth, so when you move up pressure reduces.

b) i) Vacuum

ii) Atmospheric pressure

iii) 74cm

iv) It will reduce / decrease

v) At high altitudes atmospheric pressure decrease / low atmosphere pressure.

16. (i) Maximum speed = $24ms^{-1}$

(ii) $v = u + at$
$t = 2 \times 60$ sec $= 120$Sec
$u = 0ms^{-1}$
$v = 24ms^{-1}$
$24 = 0 + a \times 120$
$a = \frac{24}{120} = 0.2ms^{-2}$

(iii) 3 min or $3 \times 60 = 180$ sec.

(iv) Distance
= area under the graph
$= ½ (5 \times 60 + 10 \times 60) \times 24$

$= \frac{900 \times 24}{2} = 10800$ m

(v) Average speed $= \frac{\text{total distance}}{\text{total time}} = \frac{10800}{60 \times 10} = 18ms^{-1}$

17.a) VR= 4

MA $= \frac{500}{200} = 2.5$

E $= \frac{2.5}{4} \times 100 = 62.5\%$

b) $mgh = ½ mv^2$

$10 \times 0.3 = \frac{1}{2}(v)^2$

$v = 2.449 \ m/s$