PHYSICS MARKING SCHEME

FORM TWO

END TERM 3 2025 EXAM

1. Mass is the quantity of matter in a body while weight is the measure of the pull of gravity on the body.

weight S.I unit Newton (N) (½mk)

mass S.I unit Kilogram(kg) (½mk)

2. Main scale reading = 7.4cm

Vernier scale reading = 4x0.01 = 0.04cm

Total reading = 7.4 + 0.04 = 7.44 cm (1mk)

3. Density of mixture = $\frac{\text{mass of mixture}}{\text{Volume of mixture}}$

Mass of fresh water = 1800 x 1 =1800g

Mass of sea water = 2200 x 1.025 = 2255g

Density of mixture = $\frac{2255 + 1800}{1800 + 2200}$

$= 1.01375 g/cm^3$

4. Ice being less dense than water, floats on water. Water at 4°C being the most dense, remains at the bottom of the lake and aquatic life survives.

5. The two balloons move towards each other. On blowing air between the balloons, the speed of air increases and pressure reduces. The high atmospheric pressure on the sides pushes the balloons towards each other.

6. Large currents can be drawn fromthem

They can be kept in a discharged condition for a very long time before the cells are ruined

They require very little attention to maintain

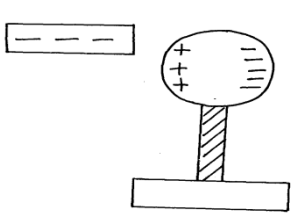
They are lighter (portable) than lead-acid accumulators

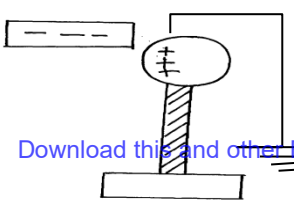
7. The magnet towards on passing the current on the coil, the core XY is magnetized with the South Pole on Y thus **attracting the North Pole of the permanent magnet.**

8. Convection is the transferof heat through fluids

Diffusion – is the process by which particles spread from regions of high concentration to those of low concentration

9. The sphere acquires a positive charge by induction method.

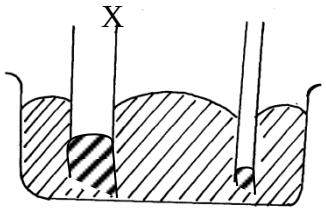




Negative charge to the ground

Earthing

10.



Y – is lower

11. w-Mg

1200 = 60xg

g = $\frac{1200}{60}$ = 20N/Kg

12. -Easily visible

-Expand or contract uniformly

-Have a wide range of temperature

-Not stick to the walls of the glass

13. 5.5 + (0.01 × 18) + 0.15

= 5.68 +0.15 mm

= 5.83 mm

13. (a) Neutral

(b) Stable

14. (a)Freely suspend the bar on the string given. Let it come to rest under the action of the earth's magnetic field. The north-seeking end of the suspended magnet will point towards magnetic north whereas the south-seeking pole will point towards magnetic south.

(b)Use repulsion for this identification process. A known pole of the magnetic in part (a) will repel a similar pole of the new magnet. Test for this. In comparison, the ends of the unmagnetised iron piece can only be attracted.

15. The rod turns.

16. (a) Is the product of force and its perpendicular distance from the line of action of the force.

(b) The longer handle provides bigger moment, while the short handle gives small moment thus can't loosen a tight nut.

17. k = $\frac{0.6}{12}$

= 0.05N/mm

(a)That total mass is [60 + (3 × 6)] = 78g. The force F due to this mass is 0.78N.

$\therefore e_1$ = F/k = 0.78/0.05

$\therefore \mathbf{e_1}$ = **15.6mm**.

Section B

18. (a) the higher the amplitude the louder the sound

(b) Use of sound absorbent materials on walls

(c) (i) Time taken for n number of claps . the distance between the girl and the walls.

(d) Sound has to travel to the walls and reflected back to the girl

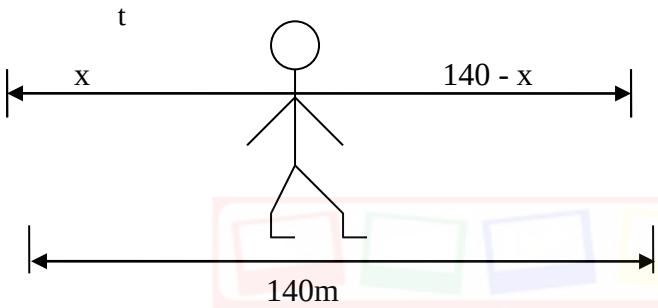
Distance traveled is 2d;

For **n** claps there will be **n** echoes

Total distance traveled = n x 2d = 2^{nd}

Speed = $\frac{2^{nd}}{t}$;

(e)



$t_1 - t_2 = 0.6$

$\frac{2x}{340} - \frac{2(140-x)}{340} = 0.6$

$\frac{2x - 280 + 2x}{340} = 0.6$

$4x = 444$

$x = 11m$

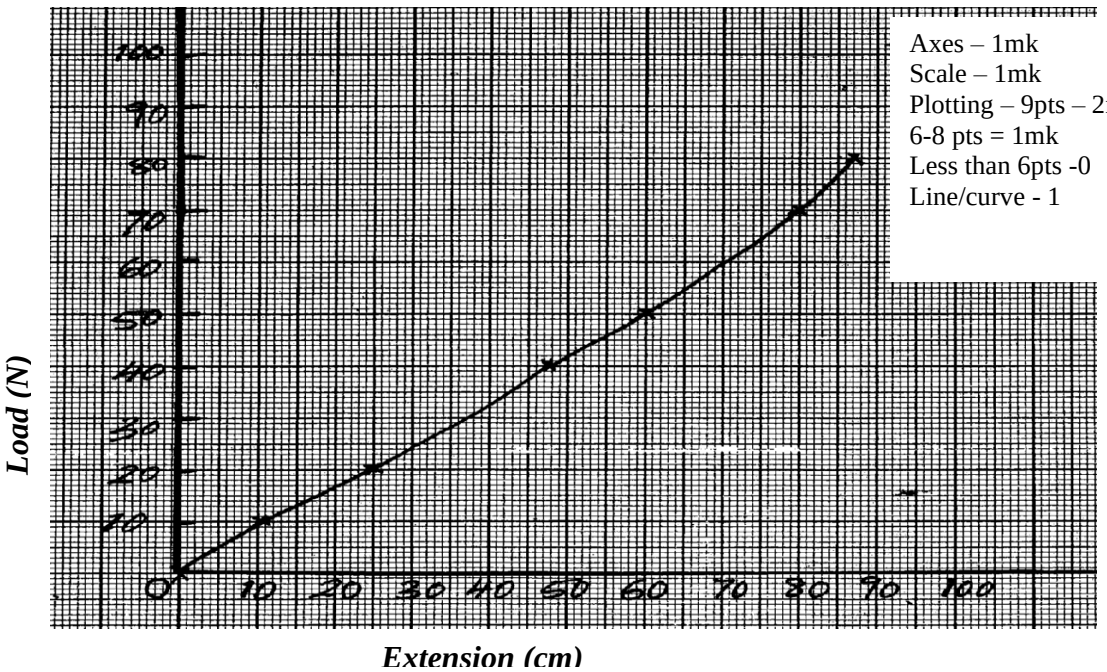
19. (a) (i) The extension of a spring is directly proportional to the force applied provided the elastic limit is not exceeded.

(ii) elasticity constant , k = f/e = gradient

$= \frac{50 - 0}{60 - 0}$

$= {}^{50}/_{60}$

(b) $= 0.833N/cm$



Axes – 1mk
Scale – 1mk
Plotting – 9pts – 2mks
6-8 pts = 1mk
Less than 6pts -0
Line/curve - 1

20. (a) Streamline flow- spread and direction of fluid particles passing anypoint do not vary with time.
turbulent flow – sped and direction of flow particles passing any point vary with time.

(b) The sheets more outwards from each other. Pressure at A and B reduces because air velocities atthese points are high

(c) $A_1V_1 = A_2V_2$

$A_1 \times 0.1 = 0.055 \times 2.2$

$A_1 = 1.21m^2$

$A = \pi r^2$

$r^2 = {}^{A}/_{\pi}$

$= \frac{1.21}{\pi}$

$= 0.6205$

D = 1.241m

(d) It enables the jet cut through the fluid with least resistance thus facilitating streamline flow.

21. (a) Pressure is force per unit area S.I unit is N/m^2 or Pascals.

(b) (i) -incompressible

-Low freezing point

-High boiling point

-Should not corrode the parts of the brake system

(ii) $P_A = P_B$

$\frac{F_1}{A_1} = \frac{F_2}{A_2}$

$\frac{100}{15} = \frac{F_2}{50}$

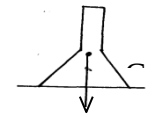
F2 = 333.3 N

(c) $P_A = P_B$

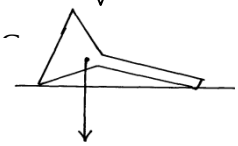
Pressure in liquids is transmitted equally in all directions.

(d) Gas is compressible in liquid is incompressible.

22. (c) (i) Stable equilibrium



(ii) unstable equilibrium



(iii) neutral equilibrium

(a) It is the point of application of the resultant force due to the earth's attraction n the body.

(b) Base area

Position of C.O.G

Vertical line drawn from C.O.G

23. (a) Longitudinal wave- particles of the medium vibrate parallel to the direction of travel of he wave.

Traverse wave - Particles of the medium vibrate at right angles to the direction of the crave.

(b)(i) amplitude = 0.4m

(ii) T = 0.20seconds

(iii) V = 0.4m/s

λ= ?

$F = {}^{1}/_{T}$

$= {}^{1}/_{0.2}$

= 5Hz

$V = f\lambda$

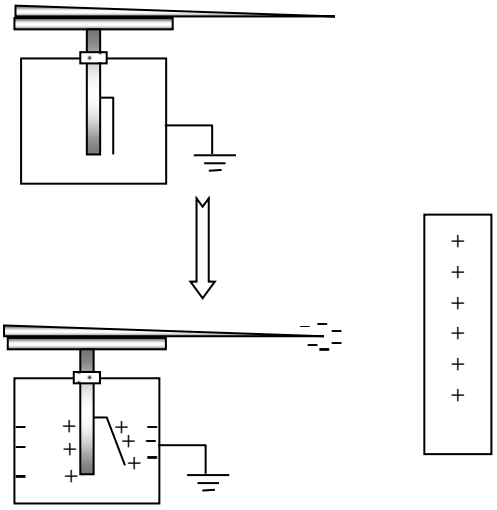
$0.4 = 5x\ \lambda$

$\lambda = {}^{0.4}/_{5}$

= 0.08m

(c) It makes it difficult for a driver to judge the distance when reversing the car since the distances

24. (a) The deflection stated arises because of the induction sequence diagrammatically described immediately below.



(b) As negative charges accumulate at the needle's tip, their high concentration causes the ionization of the air surrounding that tip. Positively charged ions will be attracted to the tip where they will take away the accumulating electrons via collisions for the sake of neutralization. The electroscope will then progressively become net positive. When the positively charged rod on the right is subsequently removed, the positive charges causing the deflection seen will redistribute. A smaller number of those charges will be left at the leaf hence maintaining a smaller deflection compared to that seen before.