

PHYSICS FORM I MARKING SCHEME

NAME..... M/S..... CLASS..... ADD.....

Instructions:

Answer all questions in the spaces provided

1. Define physics

(1 marks)
- is the study of matter in relation to energy.

2. Give two benefits of studying physics as a subject.

(2 marks)
- As a career subject
- helps in advancement of the medicine field.

3. The water volume in a burette is 30cm^3 . If 55 drops of water falls from the burette and the average volume of one drop is 0.12cm^3 , what is the final water in the burette? 3mks

$$30\text{cm}^3 - (55 \times 0.12\text{cm}^3)$$

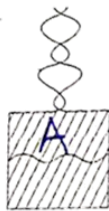
$$30\text{cm}^3 - 6.6\text{cm}^3$$

$$= 23.4\text{cm}^3$$

4. Give three basic laboratory rules. (3mks)

- One should not eat, drink or taste anything in the lab. to avoid poisoning.
- " " " run in the lab to avoid accidents.
- Open windows when in the lab for proper air circulation.

5. State with a reason what will happen to the diagram if side A is broken with a needle, and draw the final diagram (3mks)



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In a hydraulic press, a force of 200N is applied to master piston of area 25cm². If the area of the slave piston is 2500cm², determine the force generated on the slave piston. (4mks)

$$\frac{200\text{N}}{25\text{cm}^2} = \frac{N}{2500\text{cm}^2}$$

$$N = \frac{(200\text{N} \times 2500\text{cm}^2)}{25\text{cm}^2}$$

$$N = 20,000\text{N}$$

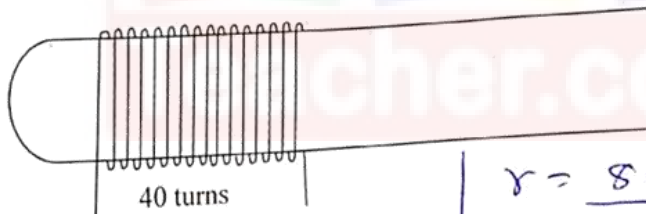
7. State three properties of a liquid that can be used as a brake fluid. (3mks)

- Should be incompressible
- Should not corrode / non corrosive
- Should have low freezing point & high boiling point

8. What are vector quantities?

A Quantity with both direction and size (2mks magnitude)

9. A thin wire was wound 40 times closely over a boiling tube. The total length of the wire was found to be 352 cm. Calculate the radius of the boiling tube in cm. (Take $\pi = \frac{22}{7}$) (3 marks)



$$1 \text{ turn} = \frac{352\text{cm}}{40} = 8.8\text{cm}$$

$$2\pi r = 8.8\text{cm}$$

$$r = \frac{8.8\text{cm}}{2\pi}$$

$$r = \underline{\underline{1.4\text{cm}}}$$

10. a) Define mass and state its SI units (2 marks)

Mass is the quantity of matter in an object.
SI unit kilogrammes (kg)

b) Name the instrument used to measure mass. (1 mark)

Beam balance.



$$\begin{aligned}
 \text{Complete squares} &= 29 \times 2.0 \text{ cm}^2 \\
 &= 58.0 \text{ cm}^2 \\
 \text{half squares} &= \frac{29}{2} \times 2.0 \text{ cm}^2 \\
 &= 29 \text{ cm}^2 \\
 \text{Total area} &= 58.0 \text{ cm}^2 \\
 &+ 29.0 \text{ cm}^2 \\
 &= \underline{\underline{87.0 \text{ cm}^2}}
 \end{aligned}$$

If the area of one small square is 2.0 cm^2 , calculate the area of the map.

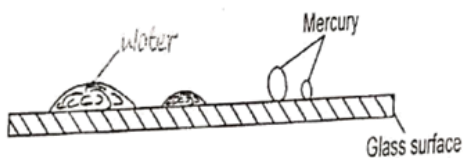
(3 marks)

12. Name four types of forces.

(4mks)

- Tension force
- Upthrust
- Magnetic
- Electrostatic

13. The figure below shows the shapes formed when drops of water and mercury are placed on the surface of a clean glass plate



Explain the difference in the shapes.

Explain the difference in the shapes.

(2mks)

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Two liquids X and Y have densities 1.25 g/cm^3 and 2.7 g/cm^3 respectively. Calculate the density of the mixture containing 30% by mass of liquid X and 70% by mass of liquid Y, if 100g mass of the mixture was used. (4mks)

$$\begin{aligned} \text{Liquid X (mass)} &= \left(\frac{30}{100} \times 100\right) \text{g} = 30\text{g} \\ \text{mass of liquid Y} &= \left(\frac{70}{100} \times 100\right) \text{g} = 70\text{g} \\ \text{Volume of liquid Y} &= \left(\frac{70}{2.7}\right) = 25.9 \text{ cm}^3 \\ \text{Volume of liquid X} &= \left(\frac{30}{1.25}\right) = 24 \text{ cm}^3 \end{aligned}$$

$$\begin{aligned} \text{Density of the mixture} &= \frac{\text{Total mass}}{\text{Total volume}} \\ &= \frac{100\text{g}}{24 + 25.9} \\ &= \frac{100}{49.9} \\ &= 2.004 \text{ g/cm}^3 \\ &= 2.00 \text{ g/cm}^3 \end{aligned}$$

14. Name the type of force used to do the work below:

a) Mosquito larvae float on water surface

- Surface Tension

b) Water rising in a narrow tube.

- Cohesion / Adhesion / Adhesive force.

c) Separate a mixture of iron filings and sand.

- Magnetism / magnetic force.

15. A tin containing 5000 cm^3 of paint has a mass of 70kg. If the mass of the empty tin, including the lid, is 0.5kg, calculate the density of the paint. (3 marks)

$$D = \frac{m}{V}$$

$$\text{Volume} = 5000 \text{ cm}^3$$

$$\begin{aligned} \text{Mass paint} &= (70\text{kg} - 0.5\text{kg}) \\ &= 69.5\text{kg} \\ &= 69500\text{g} \end{aligned}$$

$$D = \frac{69500\text{g}}{5000 \text{ cm}^3} = 13.9 \text{ g/cm}^3$$

or
 13900 kg/m^3

16. The two factors to be considered when measuring the volume of an irregular solid using displacement method. (2 marks)

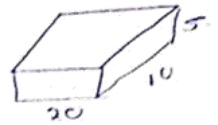
- Initial volume of the liquid before immersion
- final volume after immersion of the solid

PHYSICS FORM I MARKING SCHEME

A brick 20cm long, 10cm wide and 5cm thick has a mass of 500g. Determine the (Take $g = 10 \text{ N/kg}$)

(a) greatest pressure that can be exerted by the brick on a flat surface. (2mks)

$$G.P = \frac{F}{A} = \frac{0.5 \times 10}{\left(\frac{10 \times 5}{100 \times 100}\right)} = 1000 \text{ N}$$



(b) Least pressure that can be exerted by the brick on a flat surface. (2mks)

$$L.P = \frac{F}{A} = \frac{(0.5 \times 10)}{\left(\frac{20 \times 10}{100 \times 100}\right)} = 250 \text{ N}$$

18. Give two differences between mass and weight. (2mks)

	mass	Weight
i.	It is constant everywhere	It changes with variation in gravity from place to place.
ii.	It is measured using a beam balance	measured using a spring balance.

19. Calculate the weight of each of the following (take $g = 10 \text{ N/Kg}$): 4mks

a. A cat of mass 1.5kg

$$W = mg$$

$$1.5 \text{ kg} \times 10 \text{ N/kg} = 15 \text{ N}$$

b. A pencil of mass 5.0g

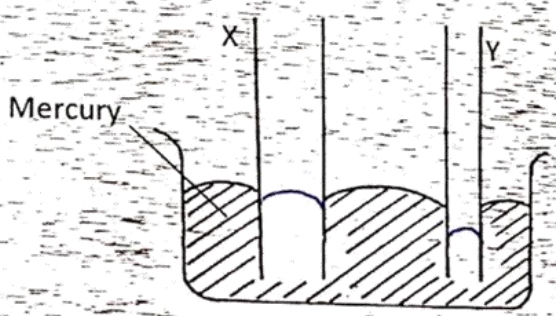
$$\frac{5.0 \text{ kg}}{1000} \times 10 \text{ N/kg} = 0.05 \text{ N}$$

20. Find the total pressure acting on a diver who is working 10m below the surface of water of density 1030 kg/m^3 , given that the atmospheric pressure is 103360 Pascals and $g = 10 \text{ N/kg}$. 3mks

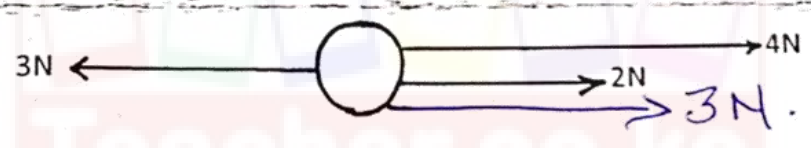
why trucks which carry heavy loads have many wheels
increase the surface area thus reducing pressure
2mks

PHYSICS FORM I MARKING SCHEME

22. Indicate on the diagram below, the level of mercury in the tubes X and Y (2mks)



23. Determine the resultant force in the following case. (2mks)



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