# AHMES SECONDARY SCHOOL

PHYSICS HOLIDAY PACKAGE DECEMBER 2021

FORM ONE

INSTRUCTIONS

Write this work in a holiday package counter book, don't use your class book.

1. (a) A rectangular metal block measuring 8cm by 5cm by 2cm has a mass of 880g. What will be the mass of a block of the same metal measuring 6cm by 4cm by 1cm?

    (b) Mention three (3) experiments that shows the existence of atmospheric pressure.

2. The diagram below shows parts of the instrument used for measuring the length of the object.
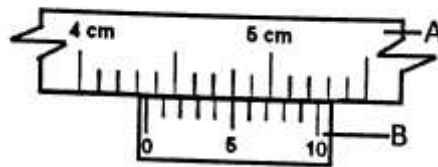
    Referring to the above figure, answer the following questions

    (i) Write the name of the scale labelled A and B

    (ii) Calculate the reading of the above instrument if the scale B is calibrated in mm

    (iii) Write the name of this instrument

3. (a) List four (4) applications of hydraulic press.

    (b) A capacitance 200uF is charged for a while. If the potential difference across its plates is 10V find the amount of charge accumulated on its plates.

4. (a) With reference to Archimedes Principle, things submerged in a fluid can either **sink** or **float**. Mention conditions influencing occurrence of each of those phenomena. (Give two to each)

    (i) Sinking   (ii) Floating

    (b) A body weighs 0.8N in air and 0.5N when completely immersed in water. Calculate

    (i) The density of the body.

    (ii) The relative density of the body.

5. (a) Explain why a sharp knife cuts meat easily than a blunt one.

(b)   What are factors affecting pressure in solid?

(c)   A hydraulic lift has piston with areas of 0.02m² and 0.1m². A car with a weight of 5000N sits on platform mounted on the large piston. How much force applied on a small piston?

6.   (a)   (i)   State flotation law

         (ii)   What is the apparent weight of a floating object?

     (b)   A block of glass of mass 250g floats in mercury of density 13600kg/m³

     (i)   What volume of the glass lies under the surface?

     (ii)   What volume of the glass remaining above the surface.

7.   A rectangular object whose dimensions are 1.4m by 0.1m by 2.0m has a density of 20kg/m³. Calculate

     (i)   Minimum pressure

     (ii)   Maximum pressure

8.   A man lifts a load of 20kg through a height of 4m in 10 seconds. Calculate

     (i)   Work done

     (ii)   Power developed by the man

9.   A ball of mass 0.5kg is dropped from a height of 10 m and on impact with the ground it losses 30J of energy. Calculate the height it reaches on the rebound.

10. (a)   A block of metal (density = 4g/cm³) was dropped in water with volume of 40cm³ and volume raised to 65cm³. Find the mass of the block.

     (b)   A clean dry beaker has a mass of 400g. 112cm³ kerosene is poured into the beaker with help of burette, if the mass of beaker and kerosene rise to 500g, find density of kerosene.

11. (a)   What is atmospheric pressure?

     (b)   Why do people suffer from nose breeding at high altitudes?

     (c)   A column of mercury is 700 mm high and the area of its base is 2.00 cm². Find
         (i)   The pressure it exerts

         (ii)   The force it exerts (use 10 m/s² and density of mercury 13.6 g/cm³)

12. (a)   Distinguish the following terms as used in physics

         (i)   Cohesion and Adhesion

         (ii)   Elastic material and Plastic material

     (b)   Outline two (**02**) applications of diffusion.

(c)   If an object with a mass of 5000 g were hung from the spring. How far in centimeters, would it stretch? (Force constant, k = 25 N/cm).

13.   (a)   Why is a hydrometer graduated with minimum reading at the bottom?

        (b)   An aluminium ball weights 6N in air, 4N when immersed in water and 3N when immersed in honey. Calculate;
            (i)   Up thrust of honey on the ball

            (ii)   Relative density of aluminum ball.

            (iii)   Relative density of honey

            (iv)   Density of honey in kg/m^3

14.   (a)   Mention any five (5) properties of light

        (c)   Illustrate angle of incidence and angle of reflection on the reflecting surface like a plane mirror.

        (b)   Determine the number of images for the following angles between two plane mirrors.

        (i) 30^0 (ii) 45^0 (iii) 60^0