

PHYSICS; PRESSURE

KCSE QUICK REVISION

*Compilation of Possible Questions in Physics Likely to be examined in
KCSE.*

*A Special Analysis of Prediction Questions that may be Tested in KCSE from this
Topic in Form 1.*

PHYSICS

SERIES 1

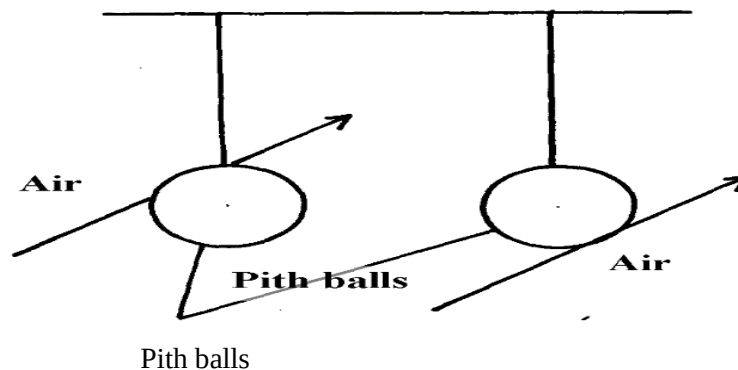
For Marking Schemes

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MWALIMU CONSULTANCY

PRESSURE

1. State the possible reason why, if water is used as a barometer liquid, the glass tube required to hold the column of the liquid is longer
2. State the definition of atmospheric pressure
3. What is the density of alcohol?
4. A person's lung pressure as recorded by a mercury manometer is 90 mm Hg. Express this pressure in SI units.
5. The figure below shows two light pith balls arranged as shown.



State what is observed when air is blown on the outer sides of the pith balls.

7. The barometric height at sea level is 76cm of mercury while at a point on a highland it is 74cm of mercury. What is the altitude of the point? (Take $g = 10\text{m/s}^2$, density of mercury = 13600kg/m^3 and density of air as 1.25kg/m^3)
8. a) **Define** specific latent heat of fusion of a substance
b) Water of mass 200g at temperature of 60°C is put in a well lagged copper calorimeter of mass 80g. A piece of ice at 0°C and mass 20g is placed in the calorimeter and the mixture stirred gently until all the ice melts. The final temperature, T , of the mixture is then measured.
Determine:
 - i) The heat absorbed by the melting ice at 0°C
 - ii) The heat absorbed by the melted ice (water) to rise to temperature T (answer may be given in terms of T)
 - iii) The heat lost by the warm water and the calorimeter (answer may be given in terms of T)

iv) The final temperature of the mixture

(Specific latent heat of fusion of ice = $334\,000\text{ J kg}^{-1}$

Specific heat capacity of water = $4\,200\text{ J kg}^{-1}\text{ K}^{-1}$

Specific heat capacity of copper = $900\text{ J kg}^{-1}\text{ K}^{-1}$)

9. Figure 4 below shows a measuring cylinder of height 30cm filled to a height of 20cm with water and the rest occupied by kerosene

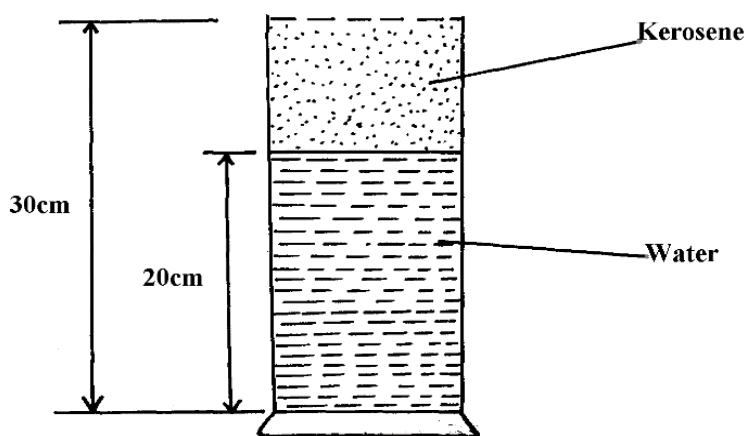


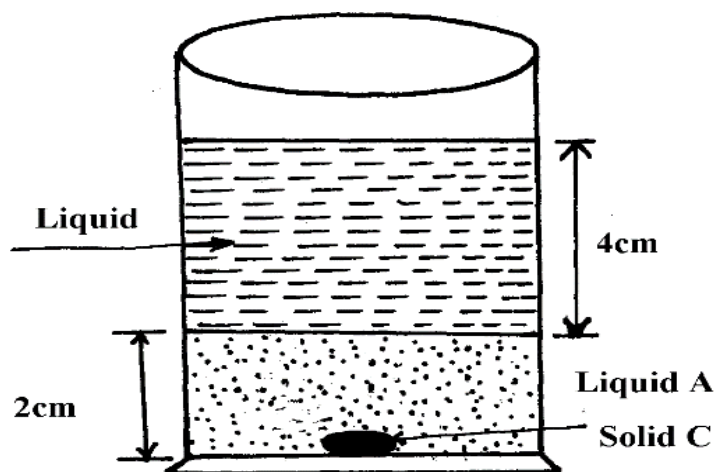
Fig. 4

Given that density of water = 1000Kgm^{-3} , density of kerosene = 800Kgm^{-3} and atmospheric pressure = 1.03×10^5 pascals, determine the pressure acting on the base of the container

10. State Pascal's principle of transmission of pressure

11. A helical spring extends by 1 cm when a force of 1.5N is applied to it. Find the elastic potential energy stored in it.

12. Two immiscible liquids are poured in a container to the levels shown in the diagram below.

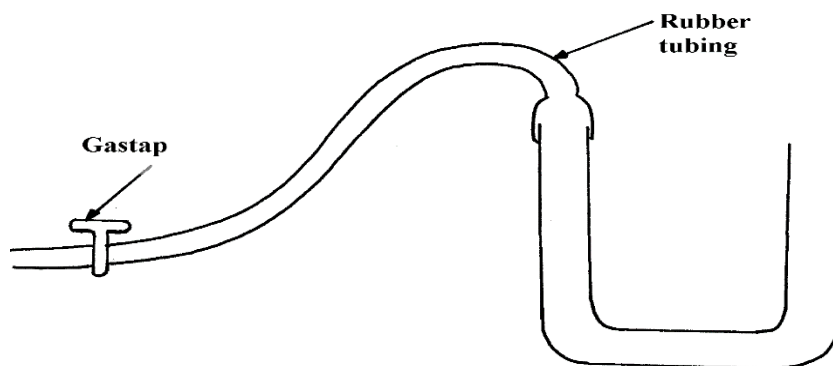


If the densities of the liquids **A** and **B** are 1g/cm^3 and 0.8g/cm^3 respectively, find the pressure acting upon solid **C** at the bottom of the container due to the liquids

13. Mark the position of the water levels in the manometer when the gas supply is fully turned on

14. Calculate the pressure of the gas supply (Atmospheric pressure = $1.0 \times 10^5 \text{Pa}$)

figure 1



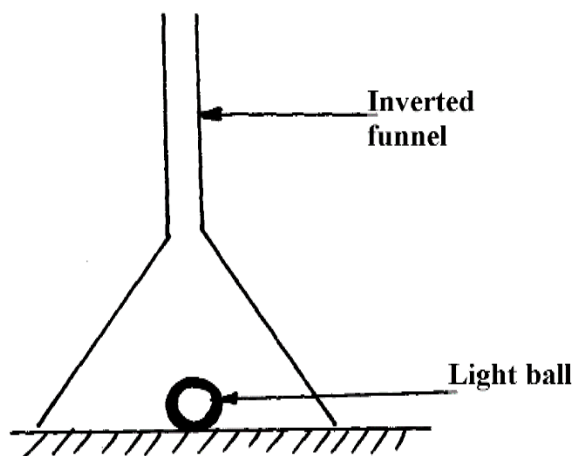
15. A small nail may pierce an inflated car tyre and remain there without pressure reduction in the tyre. Explain the observation

16. (a) State **two** ways of increasing pressure in solids

(b) The figure 1 shows a liquid in a pail

Suggest a reason why pail manufacturers prefer the shape shown to other shapes

17. **Figure 8** shows a funnel inverted over a light ball.



Explain the observation that would be made when streamlines of air is blown strongly down the narrow section of the funnel

- 18.** A block measuring 20cm x 10cm by 5cm rests on a flat surface. The block has a weight of 3N.

Determine the maximum pressure it exerts on the surface.

- 19.** The figure below shows a hydraulic press **P** which is used to raise a load of 10KN. A force **F** of 25N is applied at the end of a lever pivoted at O to raise the load

(a) State **one** property of liquid **X**

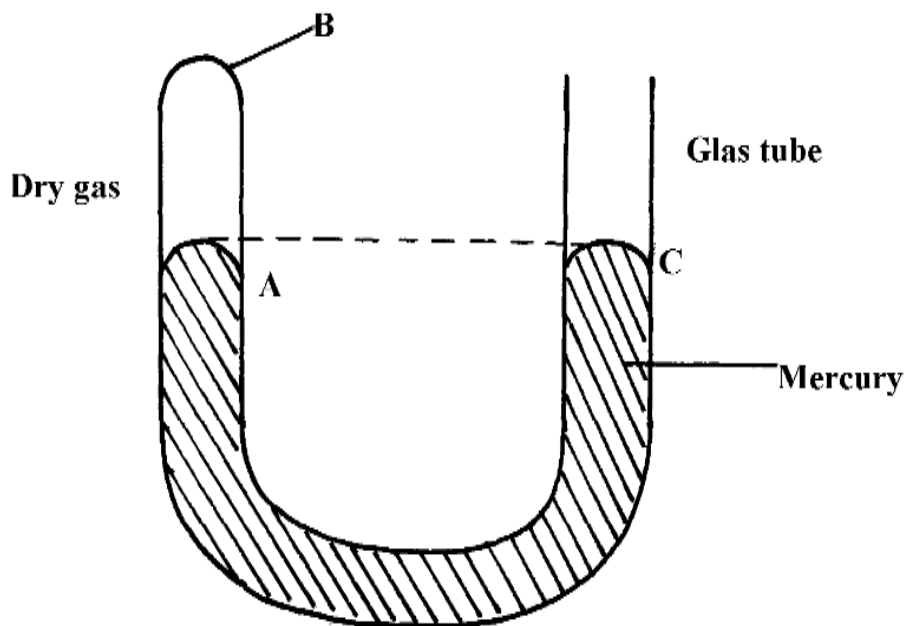
(b) Determine the distance **x** indicated on the press if force on piston **B** is 100N

- 19.** A mercury –in-glass barometer shows a height of 70cm. What height would be shown in the barometer at the same place if water density $1.0 \times 10^3 \text{ kg/m}^3$ is used.

(Density of mercury = 13600 kgm^{-3})

- 20.** The total weight of a car with passengers is 25,000N. The area of contact of each of the four tyres with the ground is 0.025 m^2 . Determine the minimum car tyre pressure

- 21.** (a) The diagram below represents a u-shaped glass tube sealed at one end and containing mercury



- (i) What is the pressure of the gas as shown in the diagram above?
(ii) Explain why the gas should be dry if it is to be used to verify a gas law
(iii) **Describe** how the arrangement can be used to verify Boyle's law.

- (b) Use the kinetic theory of gases to explain why;
- (i) the pressure of a gas increases with temperature increase
 - (ii) The pressure of a gas decreases as volume increases

22. The reading on a mercury barometer at Mombasa is 760mm. Calculate the pressure at Mombasa

(density mercury is $1.36 \times 10^4 \text{Kgm}^{-3}$)

23. The figure below is a manometer containing water. Air is blown across the mouth of one tube and the levels of the water changes as the figure below.

Explain why the level of water in the right limb of manometer is higher.

For Marking Schemes/Answers

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