PARTICULATE NATURE OF MATTER

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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PARTICULATE NATURE OF MATTER

1. (a) State the kinetic theory of matter

(b) State **two** reasons why gas particles diffuse faster than solid particles

(c) You are provided with a long glass-tube, fitting corks, cotton wool, concentrated solution hydrochloric acid and concentrated ammonia solution.

(i) Draw a possible set-up to compare the rates of diffusion of ammonia gas and hydrochloric acid gas

(ii) Outline a clear procedure on how the experiment can be carried out

(iii) What are the possible observations and conclusion

2. Distinguish between gases and liquids in terms of inter molecule forces.

3. What is the experimental evidence that shows that molecules in gases and liquids are in a state of motion

4. State Newton's second law of motion.

5. Smoke particles in air when strongly illuminated were observed to describe continuous, random haphazard movements. Explain what would be observed when the air temperature is decreased

6. State how heat transfer by radiation is reduced in a vacuum flask

7. **(a)** A partially filled balloon is placed in a bell jar with its open end on a thick glass plate as shown in ***figure 16.*** The contact between the jar and the glass plate is greased to make it air tight:

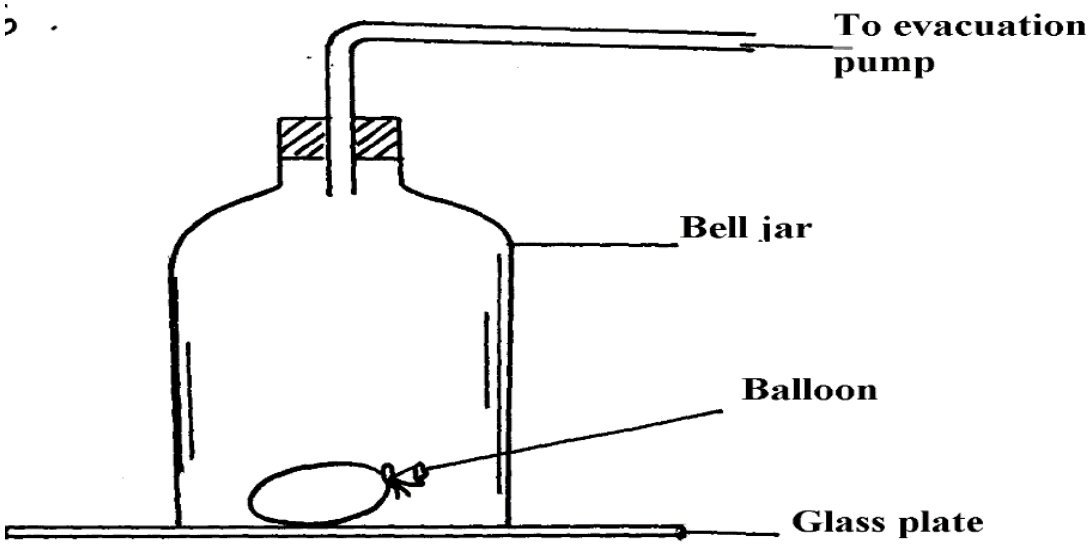
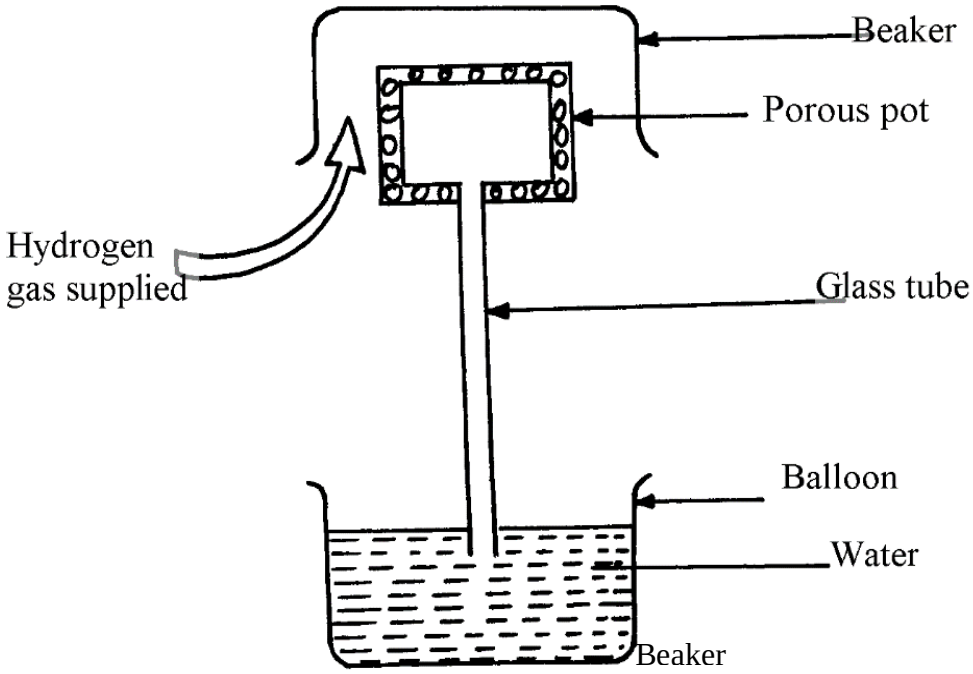


fig. 16

State and explain what happens to the balloon when air in the ball jar is slowly evacuated

(b) ***Figure 17*** below shows an arrangement to demonstrate diffusion through solids:-

fig. 17



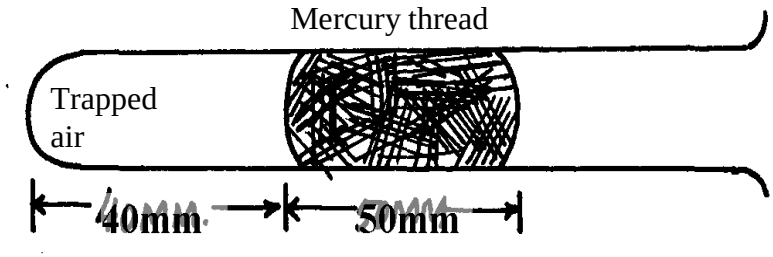
The hydrogen gas is supplied for sometimes then stopped. State and explain what is likely to be observed when the hydrogen gas supply:-

(i) is on

(ii) is stopped

(c) The diagram fig. 18 shows a glass tube containing enclosed air by a thread of mercury 50mm long when the tube is held in a horizontal position

fig. 18



(i) The tube is slowly raised in a vertical position with the open end facing up. Determine the new length of the trapped air (tube has same area of cross-section; atmospheric pressure = 750mmHg)

(ii) Account for the difference in the column of trapped air using kinetic theory of matter assuming that temperature is constant.

8. Two samples of bromine vapour are allowed to diffuse separately under different conditions, one in a vacuum and the other in air. State with reasons the conditions in which bromine will diffuse faster

9. In terms of kinetic theory of matter, explain why evaporation causes cooling

10. (a) In an experiment to demonstrate Brownian motion, smoke was placed in air cell and observed under a microscope. Smoke particles were observed to move randomly in the cell.

(i) Explain the observation

(ii) Give a reason for using small particles such as those of smoke in this experiment

(iii) What would be the most likely observation if the temperature in the smoke cell was raised?

(b) An oil drop of average diameter 0.7mm spreads out into a circular patch of diameter 75cm on the surface of water in a trough

(i) Calculate the average thickness of a molecule of oil

(ii) State **two** assumptions made in **(i)** above

11. Give a reason why gases are more compressible than liquids

12. Explain the cause of random motion of smoke particles as observed in Brownian motion experiment using a smoke cell.

For Marking Schemes/Answers

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