Answer all questions in the spaces provided

1. State two ways by which the rate of evaporation of a liquid may be increased

2. Figure 1 shows a trolley on a smooth surface being pulled by a constant force F

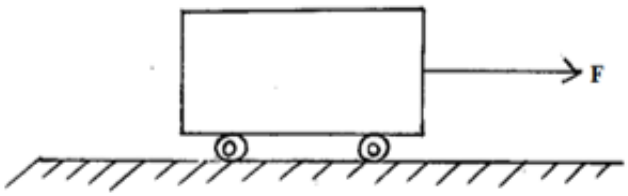
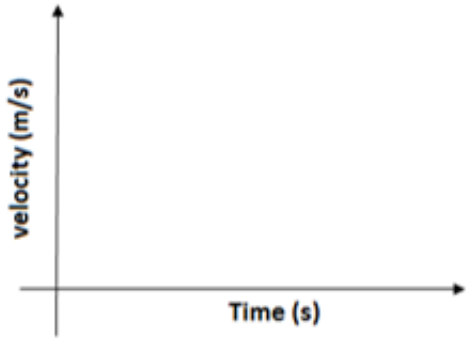


Fig. 1

On the axis provided sketch a velocity time graph for the motion of the trolley.



3. Explain why a needle dropped on water sinks and yet when placed gently it floats

4. The graph below shows how the velocity of a body varies with time when thrown vertically upwards.

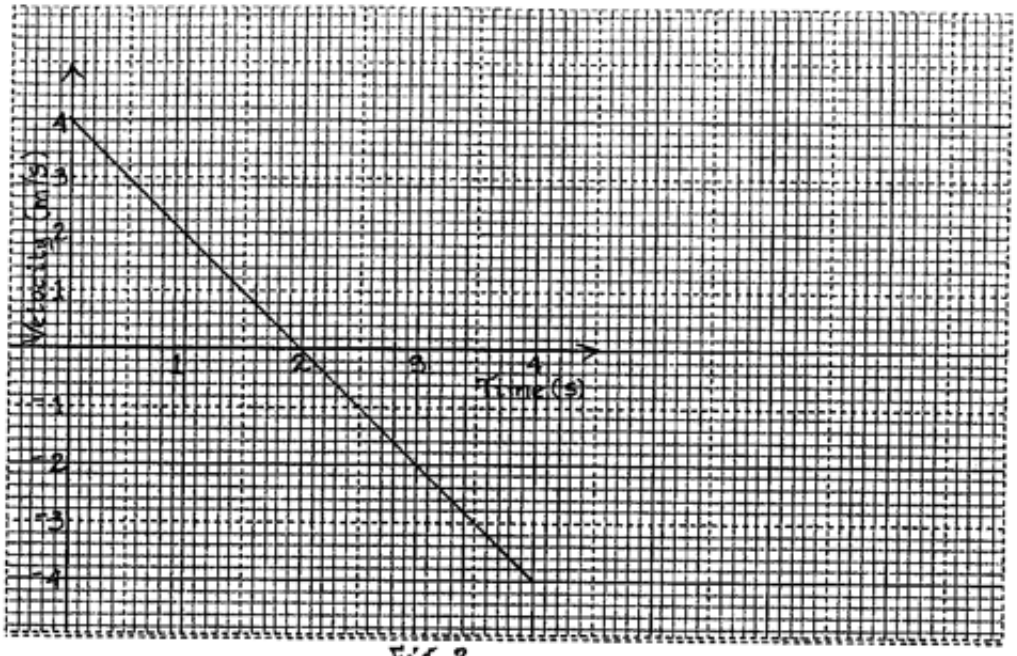


Fig. 2.

Determine the total distance moved by the body

5. n verifying the pressure law of gases, the temperature and pressure of a gas are varied at

constant volume. State the condition necessary for the law to hold.

6. Figure 3 show a light rod balanced due to the action forces. G is a magnet of weight 3N and H is a permanent magnet which is fixed. Determine the force between G and H, state whether it is attractive or repulsive.

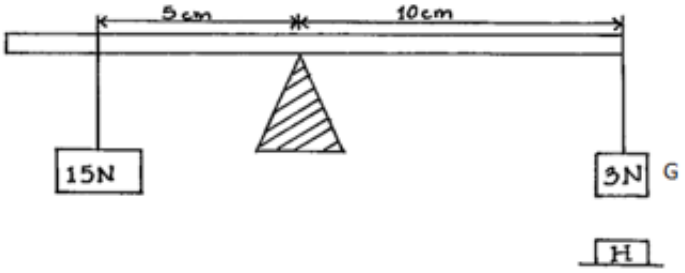


Figure 3

7. An aeroplane is moving horizontally through still air at a uniform speed. It is observed that when the speed of the plane is increased; its height above the ground increases. State the reason for this observation

8. A balloon is filled with a gas which is lighter than air. It is observed to rise in air upto a certain height. State a reason why the balloon stops rising

9. A man lifts a weight of 300N through a vertical height of 2m, in 6 seconds. Determine the power developed.

10. For a body to be in equilibrium the sum of clockwise moment on the body must be equal to sum of anticlockwise moments about the same point. State the other condition for it to be in equilibrium.

11. An oil drop forms a circular patch of an area 5.0 x10-13cm$^{2.}$ If the drop has a volume of 9.0 x 10-14cm^{3}, estimate the diameter of the oil molecule

12. State one molecular difference between a real gas and ideal gas.

13. A Girl in a school in the Coast region plans to make a barometer, using sea water of density 1030kgm-3. If the atmospheric pressure is 103000Nm-2. Determine the minimum length of the tube she will use. Take g =10N/kg.

Answer all questions in the spaces provided

14. a) A faulty mercury thermometer reads 100C when dipped into melting ice and 900C when in steam at normal atmospheric pressure. What would this thermometer read when dipped into a liquid at 200C

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b) State the importance of the following features of a liquid in glass thermometer.

i) Thin walled bulb. .....
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ii) Narrow capillary tube

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c) State two qualities of good thermometric liquid.

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d) Sketch a graph to show the variation of the volume of water with temperature cooled from 00C to 20^0C.

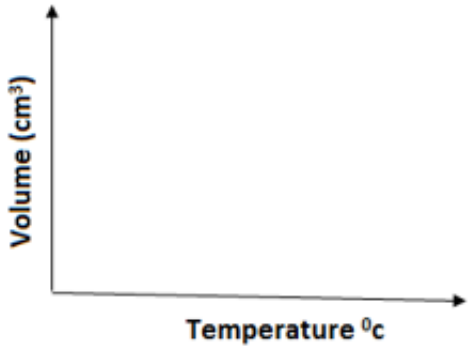

Figure 4

e) Explain how ice-bergs formed in the sea's is dangerous to the navigators

15. a) Define the term Latent heat of vapourization

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b) In an experiment to determine the specific Latent heat of water, steam at 100^0C, was passed into water contained in a well lagged copper calorimeter. The following measurements were made. Mass of calorimeter = 60g Initial mass of water = 80g Initial room temperature of water = 15^0C Final temperature of water = 35^0C

Final mass of water + calorimeter + condensed steam = 160g Taking specific heat capacity of water = 4200Jkg-1K-1 and specific heat capacity of copper =390Jkg-1k-1 calculate

i) Mass of condensed steam.

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ii) Heat gained by calorimeter

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..... iii) Heat gained by water in calorimeter.

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..... iv) Determine the specific Latent heat of vapourization Lv

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c) **Figure 5 shows an investigation on boiling temperature of water.**

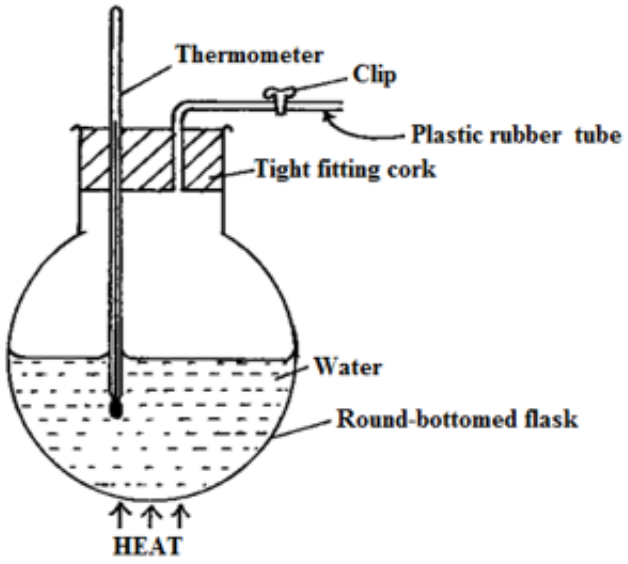

Fig.5

When water started boiling the plastic rubber tube was clipped and heating continued

i) State what happen to the boiling temperature after sometime

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ii) Explain the observation above using the kinetic theory of the molecules.

16. When a force of 6N is applied to a blocks of mass 2kg, it moves along a table at constant velocity.
a) What is the frictional force?

b) The force applied was increased to 10N. Determine

i) The resultant force.

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ii) The acceleration

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iii) The velocity, if it accelerates from rest in 10 seconds.

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c) A bullet of mass 10g is fired at 400m/s from a rifle of mass 4kg.

Determine the recoil velocity of the rifle.

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17. Ian has a mass of 70kg. He dives from diving board. His vertical velocity at different times is shown in the graph below Gravitational field strength =10N/kg

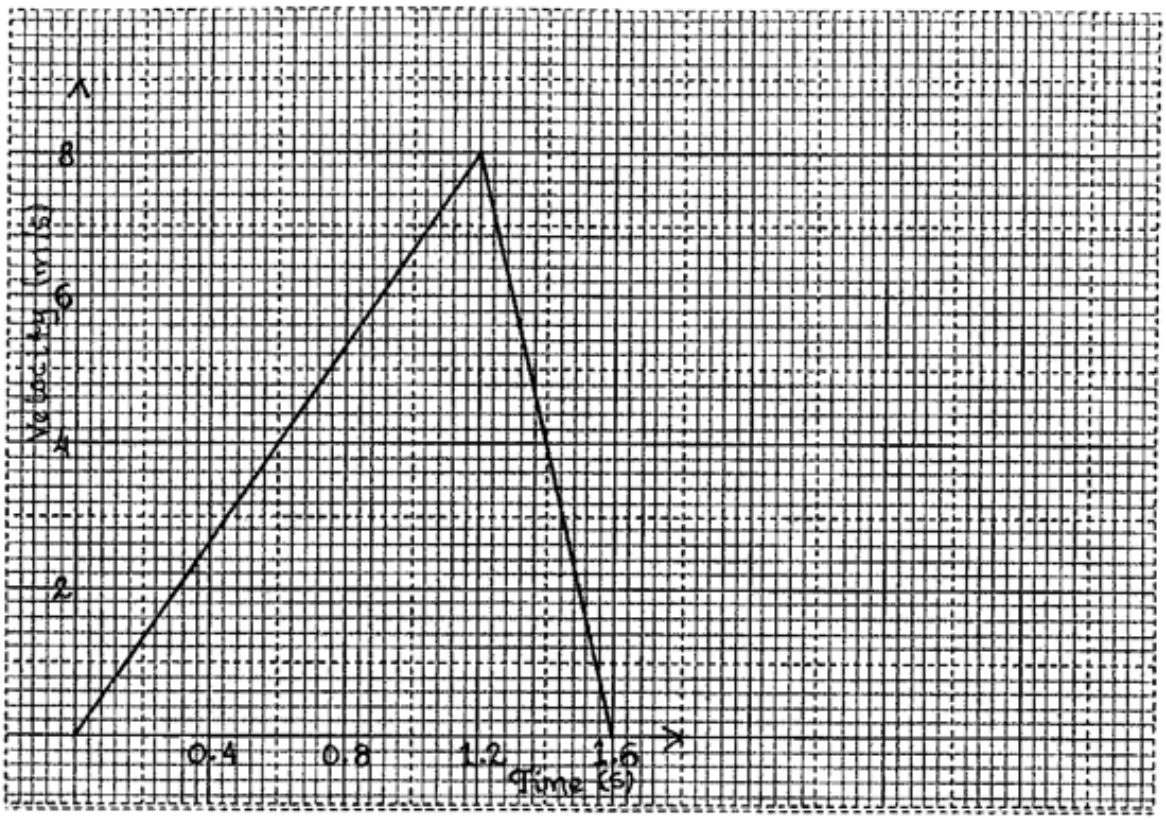

Fig. 6.

a) From the graph determine i) The time that he took to reach the water.

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iii) Ian's deceleration in the water.

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iv) The retarding force on Ian in the water.

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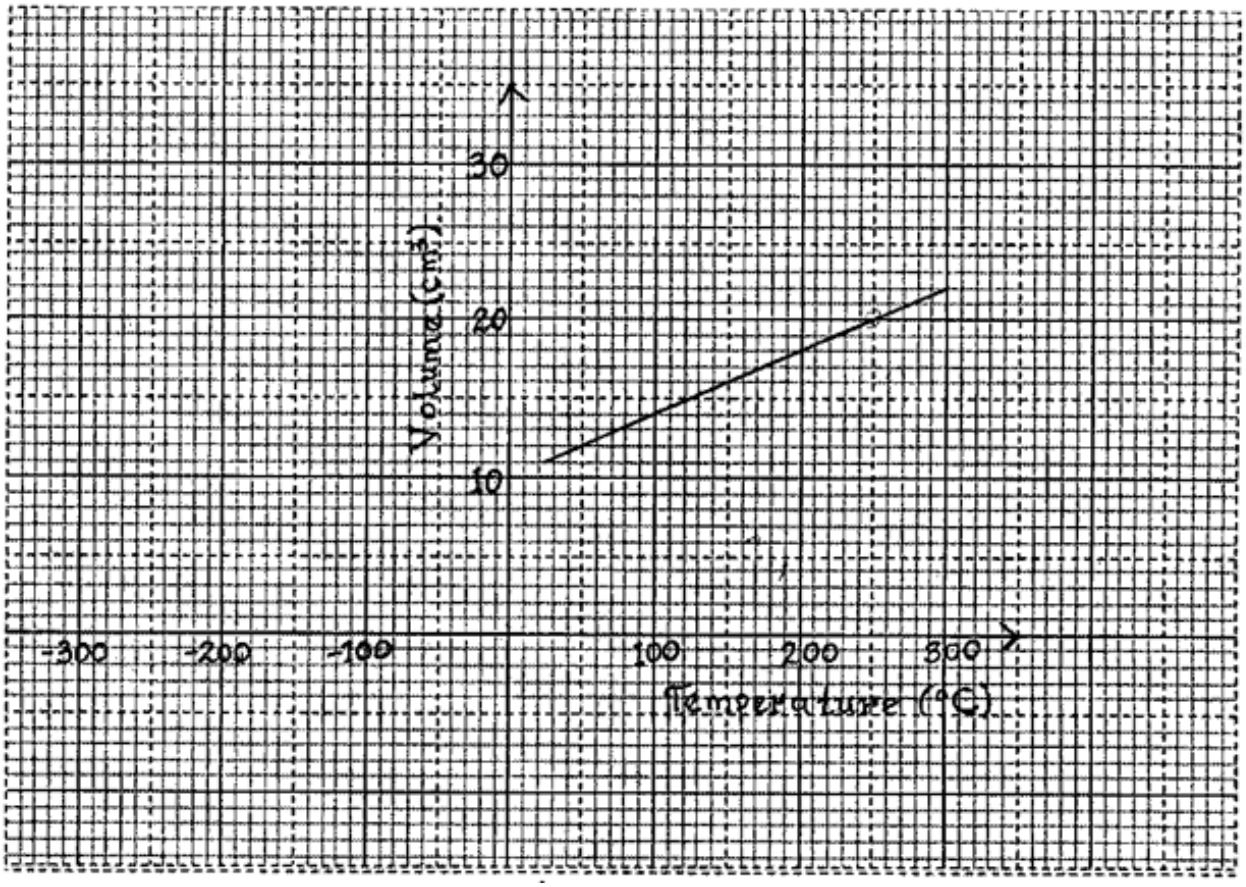
v) The depth in water that Ian reached.

18. a) Figure 7 sows a graph of volume against temperature for a given mass of gas.



Use the graph to determine the absolute temperature in ^{0}C.

b) Figure 8 shows a horizontal tube containing air trapped by a mercury thread of length 24cm. The length of the enclosed column is 15cm. The atmospheric pressure is 76cmHg.

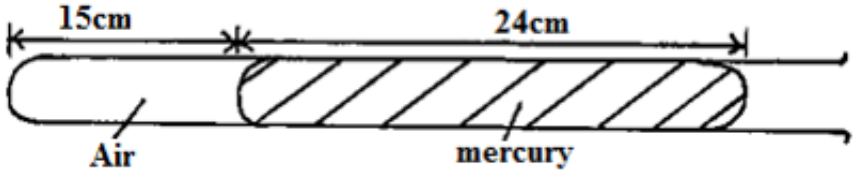


Fig.8

i) State the pressure of the enclosed air.

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ii) The tube is now held in a vertical position with the open end facing upwards as shown figure 9.

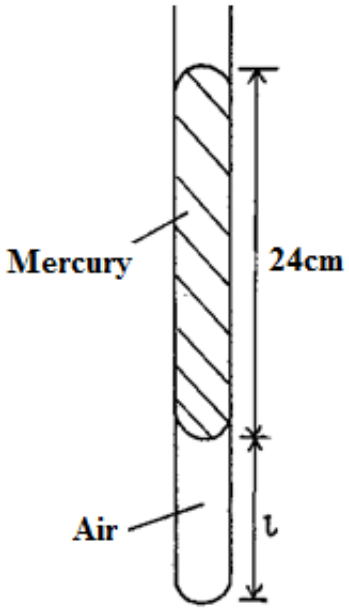

Figure 9

Determine

I) The pressure of the enclosed air.

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II) The length (ℓ) of the enclosed air column.

c) In an experiment to demonstrate atmospheric pressure, a plastic bottle is partially filled with hot water and the bottle is then tightly corked. After sometime the bottle starts to get deformed. i) State the purpose of the hot water.

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ii) State the reason why the bottle gets deformed.

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iii) Explain the answer in c(ii)