GUCHA SOUTH EVALUATION TEST (GSET) 2016

Kenya Certificate of Secondary Education (K.C.S.E)

232/1

PHYSICS

PAPER 1 (THEORY)

1. The figure 1 below shows a micrometer screw gauge that has a zero error of +0.02. State the actual reading of the micrometer screw gauge. (1 mark)

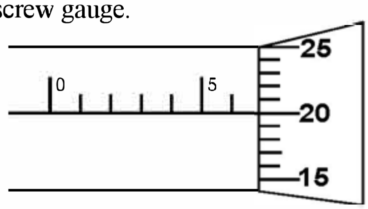


Fig 1

2. In the figure 2, below, U-tube contains two immiscible liquids P and Q. If the density of Q is 900kg/m³ and that of P is 1200kg / m³, Calculate the height of liquid Q. (3 marks)

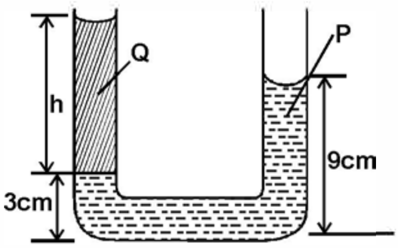


Fig 2

3. Distinguish between latent heat of fusion and specific latent heat of fusion of a substance. (1 mark)
4. A mass of 8kg is whirled round in a horizontal circle using a rope that is 80cm long, it is takes 2½ circles in 1 second, calculate the tension the rope experiences. (3 marks)
5. Fig 3 shows a solid cylinder standing on a horizontal surface. The cylinder is in stable equilibrium.

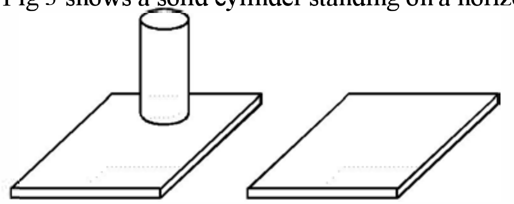


Fig 3

On the horizontal space provided, sketch the cylinder in neutral equilibrium (1 mark)

6. In terms of intermolecular forces, explain the difference between liquid and gaseous state.
7. (a)Under what conditions can a feather and a stone released from the same height land on the ground at the same time?

   (b) On the axis on figure 4 below, sketch displacement time graph for accelerating body. (1 mark)

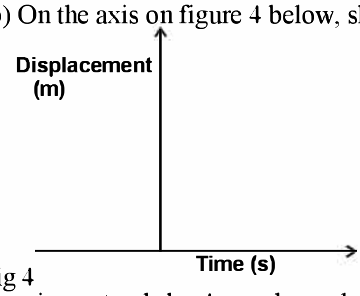


Fig 4

8. A spring extends by 4cm when a load of 10N is suspended from it. Six similar springs are used in the system shown in figure 5. Determine the total extension. (3 marks)

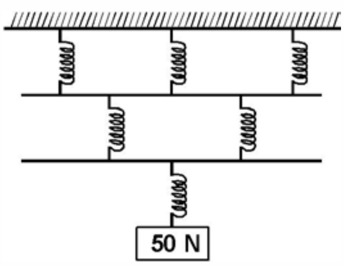


Fig 5

9. Explain how heat loss by radiation is minimized in a vacuum flask. (1 mark)
10. A pipe of radius 2mm is connected to another pipe of radius 6mm. If water flows in the narrow pipe at a speed of 3m/s, determine the speed of water in the wider pipe. (3 marks)

Fig 6 shows the features of a dry cell (leclanche). Using the information in the figure to answer questions 11 and 12.

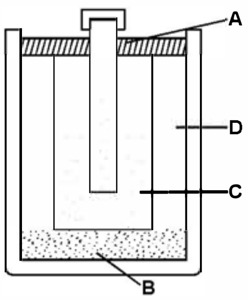


Fig *6*

11. State the polarities of the parts labelled A and B. (1 mark)
12. Name the chemical substances in the parts labelled C and D. (2 marks)
13. The light uniform bar in figure 7 is in equilibrium. The two beakers A and B contain water at the same temperature. The two blocks are made of the same material.

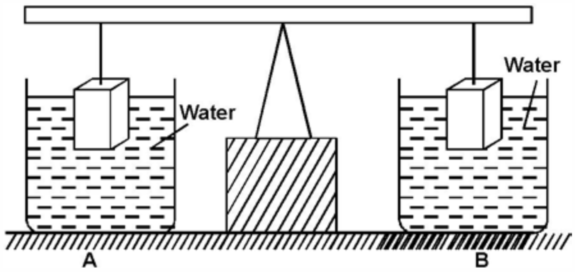


Fig 7

If the temperature of the water in beaker A is now raised, explain why the beam tips to side A. Assume the solid does not expand. (2 marks)

14. A stone thrown vertically upwards from the base of a mountain with an initial velocity of 100m/s. The stone just stopped as the apex and came back. Another boy projected a stone horizontally from the top of the mountain. Calculate:
    (a) Height of the mountain. (2 marks)
    (b) Time taken for the stone to follow the trajectory. (2 marks)
    (c) The range if the horizontal velocity is 20m/s. (2 marks)
    (d) Calculate the impulse of force produced when a table is pulled for 3 seconds by a constant force of 10N towards the right and then for 2 seconds by a constant force of 20N towards the left. (2 marks)
    (e)The figure 8 below shows a tape from a trolley accelerating at 5m/s and the timer is vibrating at 100HZ.

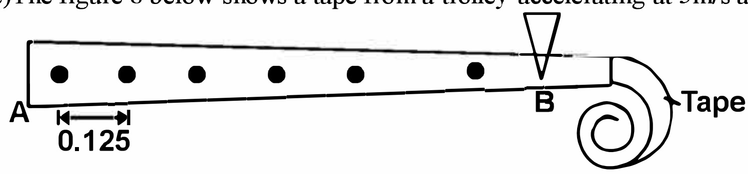
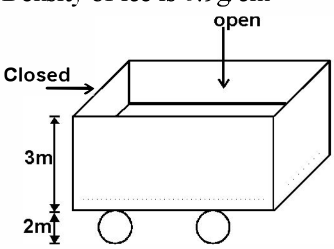


Fig 8

(i) Change in velocity from A to B. (2 marks)
(ii) The final velocity of the trolley. (2 marks)

15. (a) Two gear-wheel have 80 teeth and 20 teeth and they lock with each other. They are fastened on axles of equal diameter such that equal weight of 150N attached to the string around the axle will just raise 450N on the other axles. Calculate
    (i) The mechanical advantage. (2 marks)
    (ii) The velocity ratio. (2 marks)
    (iii) The efficiency of the machine. (2 marks)
    (b) (i) A loudspeaker is a transducer. Explain. (1 mark)
    (ii) Explain the energy change that occur when a man climbs the mountain. (1 mark)
    (c) Calculate the total power in lifting 0.2kg of metal cane containing $2000cm^3$ of ice onto a lorry as shown below within 4S. Density of ice is $0.9g/cm^3$ (3 marks)



16. (a) What is meant by term specific latent heat of vaporization? (1 mark)
    (b) In an experiment to determine the specific latent heat of vapourisation of water, steam at 100°C was passed into water contained in a well lagged copper calorimeter. The following measurements were made :-
    Mass of calorimeter = 50g
    Initial mass of water 70g
    Initial temperature of water = 5°C
    Final mass of water + Calorimeter + condensed steam = 123g
    Final temperature of mixture = 30°C

Specific heat capacity of water = 4200jKg^{-1}k^{-1}
Specific heat capacity of copper = 392jKg^{-1}k^{-1}

I. Determine the:-
(i) Mass of condensed steam. (1 mark)
(ii) Heat gained by water and calorimeter. (2 marks)

II. Given that L is the specific latent heat of vaporization of steam.
(i) Write an expression for the heat given out by steam. (1 mark)
(ii) Determine the value of L. (3 marks)

III. The specific latent heat of fusion of ice is 334J/g. Explain what this means. (1 mark)

IV. The specific heat capacity of pure water is 4200J/ kg /k while that of sea water is 3900J/kg/k. Which of the two liquids is the most appropriate to be used in cooling systems. Give a reason. (2 marks)

17. (a) State the law of floatation. (1 mark)
(b)The figure 10 below represents a sphere 0.012m³ volume and mass 5kg floating between two liquids A and B such that $^2/_3$ of its volume is in liquid A. Density of liquid B is 800kg/m³
(Take g = 10N/kg).

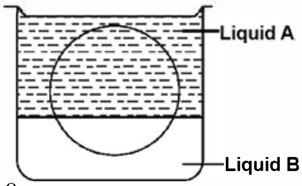


Fig 10

Determine
(i) Weight of liquid B displacement. (2 marks)
(ii) Weight of liquid A displaced. (1 mark)

c) The sphere is now anchored at the base of the container that ¼ of its volume is in liquid A. Find the tension in the string. (3 marks)

d) Explain why a hydrometer has the following:
(i) Lead shots in the bulb. (1 mark)
(ii) Narrow stem. (1 mark)

18.(a) State Newton's second law of motion. (1 mark)
(b) A wooden block resting on a horizontal bench is given an initial velocity, U, so that it slides on the bench surface for a distance, d, before conung to stop. The values of d were measured and recorded for various values of initial velocity. Figure 11 shows the graph U² against d.

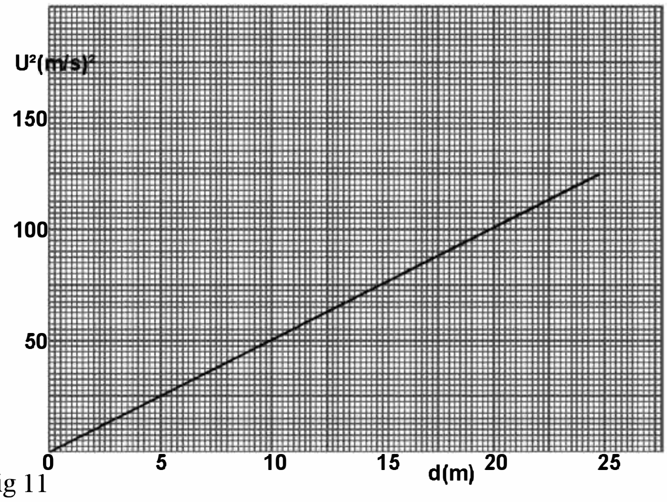


Fig 11

(i) Calculate the slope S of the graph. (3 marks)
(ii) Given that U² = 20kd, where k is a constant for the bench surface, determine the value of k from the graph. (2 marks)
(iii) State how the value of K would be affected by a change in the roughness of the bench surface. (1 mark)

(c)A care of mass 800kg starts and accelerates at 1.2ms^{-2}. Determine its momentum after it has moved 400m from the starting point. (3 marks)