# KENYA HIGH SCHOOL

# MOCK 2019

# PHYSICS PAPER 1

## INSTRUCTIONS TO CANDIDATES

(a) This paper consists of two sections A and B
(b) Answer all questions in section A and B in the space provided
(c) All working must be clearly shown
(d) Silent non-programmable electronic calculator may be used
(e) Candidates should answer the questions in English6

## SECTION A: (25 MARKS)

1. The figure below shows the reading on a burette after 30g of a liquid was removed from it
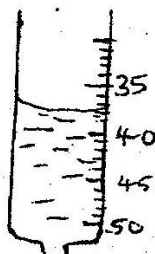


Determine the density of the liquid

(2 marks)

2. When the stopper is removed from the bottle containing liquid ammonia, the ammonia can be Smelled in all parts of the room after sometimes. Explain

(2 marks)

3. Explain why ice skater have narrow blades

(2 marks)

4. Explain the significance of the following features of a common liquid –in – thermometer
   (i) The thin walled bulb

( 1 mark)

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      (ii)     A very fine bore                                            ( 1 mark)

      (iii)    Thick walled stem with bulge in the glass down one side         ( 1 mark)

5.      A glass beaker, half filled with water is placed upon wire gauze on a tripod and the gauze is heated from below using a Bunsen burner. Explain
      (i)      Why is the wire gauze used                               ( 1 mark)

      (ii)     Why a thick glass beaker would be more liable to crack than a thin one    ( 1 mark)

      (iii)    The process by which the heat is distributed throughout water        ( 1 mark)

6.      When will an object be in equilibrium                              (1 mark)

7.      State one factor that determines the height to which a liquid in a capillary tube rises at a particular place                                              (1 mark)

8.      Explain the action of a straw used to drink soda from a bottle            (2 marks)

9 .     A wet umbrella gets dried faster when its handles is rotated at high speed .Explain   (1 mark)

10.    The figure below shows a thin wooden strip of negligible weight balanced by forces $F_1$ and $F_2$ Show the relationship between $X_1$ and $X_2$                 ( 2 marks)
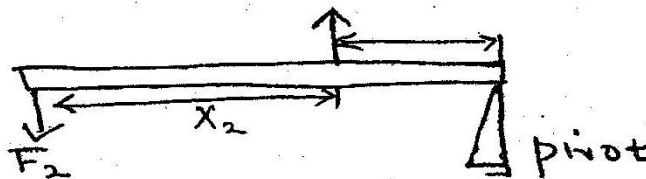


11.    A catapult is used to fire a stone of mass 50g vertically to height of 4.05m.Calculate
      (i) The potential gained by the stone                           ( 1 mark)

      (ii) The speed of the stone as it leaves the catapult                 ( 2 marks)

12. Suggest one method of improving efficiency of machine

(1 mark)

13. Explain why an air bubble increases in volume as it rises from the bottom of a lake to the surface

( 2 marks)

14. Explain why it takes less time to boil vegetable in a sufuria with a lid on rather than one Without a lid

( 1 mark)

## SECTION B: (55 MARKS)

15. A metal block (density 5000 kg/m3) of length 80mm breadth 40mm and height 25mm is attached to a spring balance A as shown in the figure below. The mass of the empty beakers on the compression balance B is 100g.



(a)
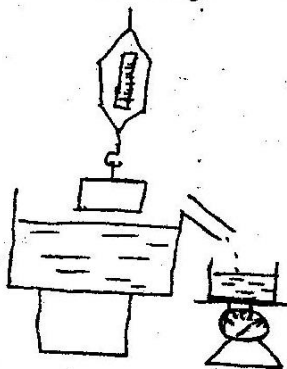
(i) What are reading of the spring balance A and the compression balance B when The metal block is in air

(3 marks)

(ii) The block is lowered slowly until it is partially submerged to a depth of 10mm

(3 marks)

(iii) The block is lowered such that it is completely submerged just below the surface of water

(3 marks)

(iv) The block is now lowered slowly until it rests on the bottom of the beaker    (2 marks)

16. (a) The diagram shows the main components of a domestic refrigerator (12 marks)
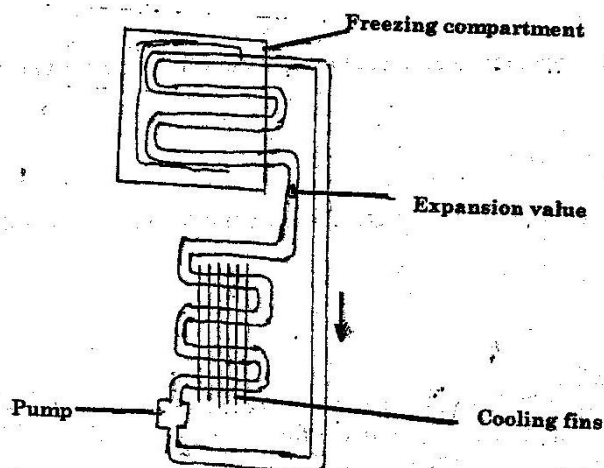


(i) Why is the freezing compartment located near the top of the cabinet (2 marks)

(ii) Explain what is happening in the tubes in the freezing compartment (2 marks)

(iii) Explain why the external metal fins becomes hot when the refrigerator in operation (2 marks)

(iv) What is the purpose of the pump and expansion value (2 mark)

(b) Stem is bubbled into a vessel containing a quantity of water and 20g of ice at 0° C. The mass of the vessel and content is then found to increase by 2g.Calculate the mass of ice melted (4 marks)

17. (a) Define the term Centripetal force (1 mark)

(b) Explain how banking a road at the point where it curves reduces skidding of vehicles off the road (3 marks)

(c) The figure below shows the centrifuge that is used to separate particles suspended in a liquid particle of different masses $M_1, M_2$ and $M_3$ are suspended in a liquid in which they do not dissolve. The system is then rotated in the direction shown.
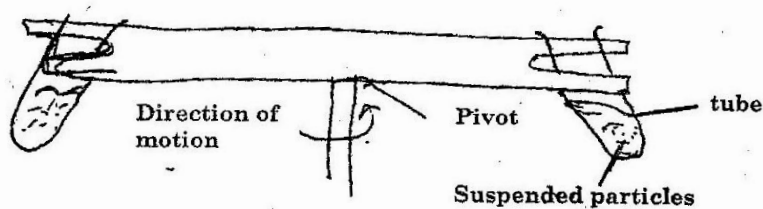


(i) Explain why the particles of different masses will acquire radii as the system is rotated
(2 marks)

(ii) If $M_3 > M_2 > M_1$ arrange the particle in increasing radii. When the centrifuge is rotated after some time

(iii) Would the separation take place if the test tube remained vertical as the centrifuge rotated Explain your answer
(2 marks)

(d) A car of mass 1200kg is negotiating a curve of radius 45m on a horizontal road. The force of friction between the tyres and road is 6700N.
Determine the maximum speed at which the car can be driven without going off the road
(3 marks)

18. (a) In an experiment to demonstrate Brownian motion, smoke was put in an air cell and observed to move randomly in the cell
(i) Explain the observation
(1 mark)

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

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

(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 the oil
(4 marks)

(ii) State two assumptions made in (b)(i) above when calculating the thickness of a molecule
(2 marks)

19.    (a) State Newton's third law of motion

                                                                                (1 mark)

       (b)    A ball of mass 0.75kg rests on the surface of a level bench

                                                                                (2mks)

              (i)    Draw a sketch showing the forces acting on the ball and give the magnitude of the
                     forces.
                                                                                (2 marks)

              (ii)   If the ball was raised 1.5m above the surface and then released, what would be its
                     kinetic energy just before hitting the surface"
                                                                                (2 marks)

       (c) The figure below shows a block of wood of mass 5kg sliding down rest on a plane inclined at
           an angle of 30⁰ to the horizontal. A frictional force of 6N acts between the wooded block and
           the plane

                                   Block of wood
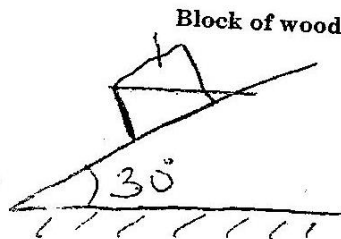


              (i)    Show on the diagram the forces acting on the wooden block

                                                                                ( 3 marks)
              (ii)   Determine the force accelerating the wooden block down the plane

                                                                                ( 2 marks)

       (d) A body of mass 5kg is ejected vertically from the ground, when a force of 600N acts on it for
           0.15s .Calculate the velocity with which the body leaves the ground          ( 2 marks)