

NAME.....Index no.....ADM NO.....CL.....

232/1
PHYSICS
Paper 1
(THEORY)
2 hours

Candidate's Signature.....

Date.....

TRIAL ONE EVALUATION TEST 2019
Kenya Certificate of Secondary Education
MARCH TEST

INSTRUCTIONS TO CANDIDATES

- Write your **name, index number, admission number and class** in the spaces provided above.
- **Sign and write** the date of examination in the spaces above.
- This paper consists of **TWO** sections: **A** and **B**.
- Answer **ALL** the questions in sections **A** and **B** in the spaces provided.
- **ALL** working **MUST** be clearly shown.
- Non-programmable silent electronic calculators and KNEC mathematical tables may be used.
- This paper consists of **13 printed pages**.
- **Candidates should check the question paper to ascertain that all the pages are printed as indicated and that no questions are missing.**

For Examiner's Use Only

Section	Question	Maximum Score	Candidate's Score
A	1 – 11	25	
B	12	13	
	13	11	
	14	9	
	15	12	
	16	10	
	Total Score		80

Section A (25 marks)

Answer ALL the questions in the spaces provided

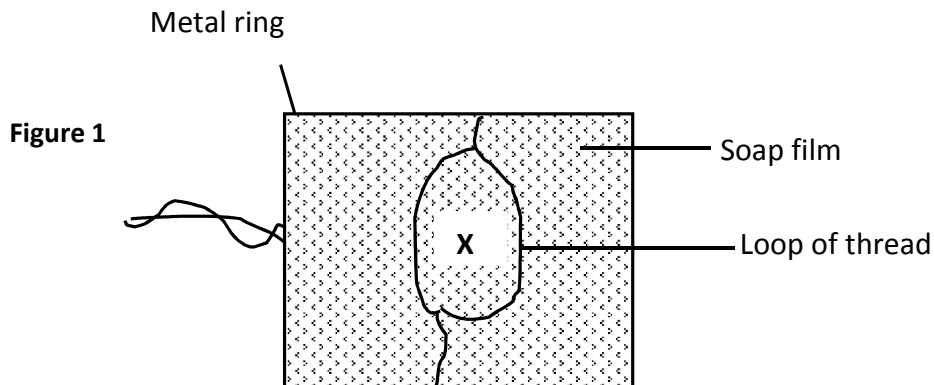
1. Mechanics is one of the branches of physics. State what it deals with. (1mark)

2. In an experiment to determine the relative density of a substance using a density bottle the following measurements were taken.

- Mass of empty density bottle = 43.2 g
- Mass of bottle full of water = 66.4 g
- Mass of bottle filled with liquid X = 68.2g

Use the data to determine the density of the liquids. (3marks)

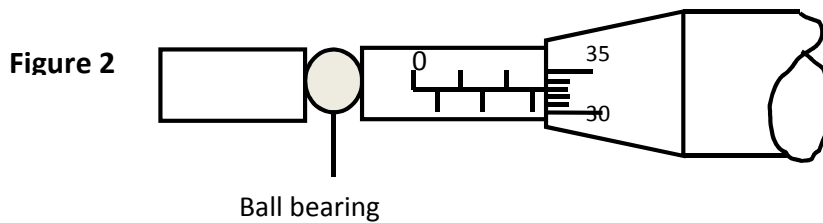
3. **Figure 1** below shows a soap film formed on a metal ring and a loop of thread inside it.



(i) Explain what will happen when the film is punctured by a needle at X. (2marks)

(ii) What is the name given to the force acting on the thread? (1mark)

4. Why are gases more compressible while liquids and solids are almost incompressible? (1mark)
5. Explain why when graduating the upper fixed point of a thermometer; the bulb is put in steam above boiling water and not boiling water. (1marks)
6. While heating water in a beaker, wire gauze is place below the beaker. Explain. (2marks)
7. A ball bearing of mass 1.5×10^{-4} kg is held between the anvil and spindle of a micrometer screw gauge as shown in the **Figure 2** below.



Before the instrument was the zero error was found to be 0.03 mm.

- (i) What is the diameter of the ball bearing? (2mark)
- (ii) Find the density of the ball bearing correct to 3 significant figures and in SI units. (2marks)

8. Explain why a Matatu is more likely to topple over when the roof rack is heavily loaded than when the roof rack is empty. (2marks)

9. Figure 3 shows two identical metallic cans A and B, filled with water at room temperature. An electric heater is placed at equal distances from A and B.

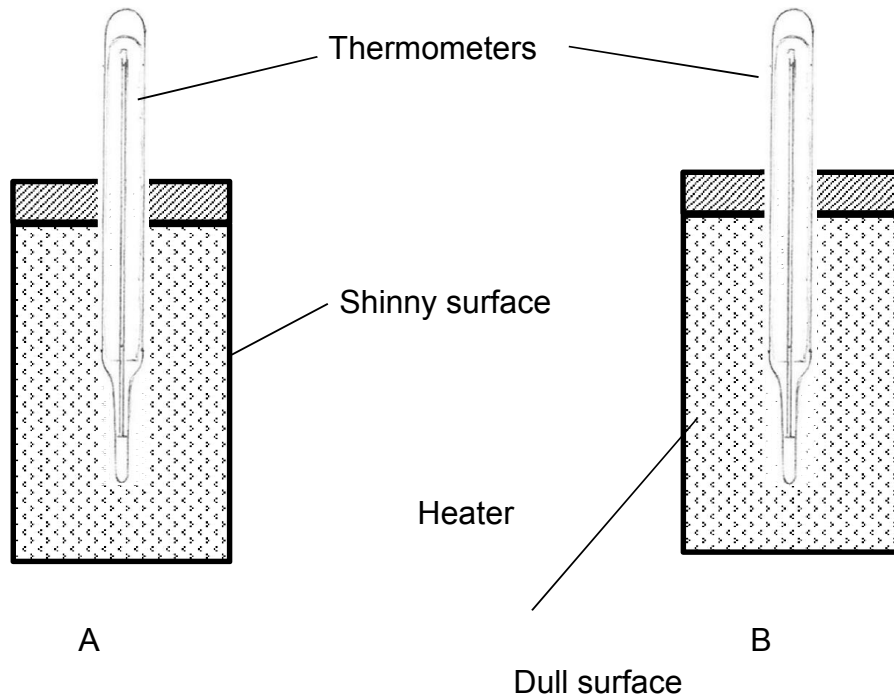


Figure 3

In figure 4 sketch a graph to show the variation of temperature with time for the two surfaces. (2 marks)

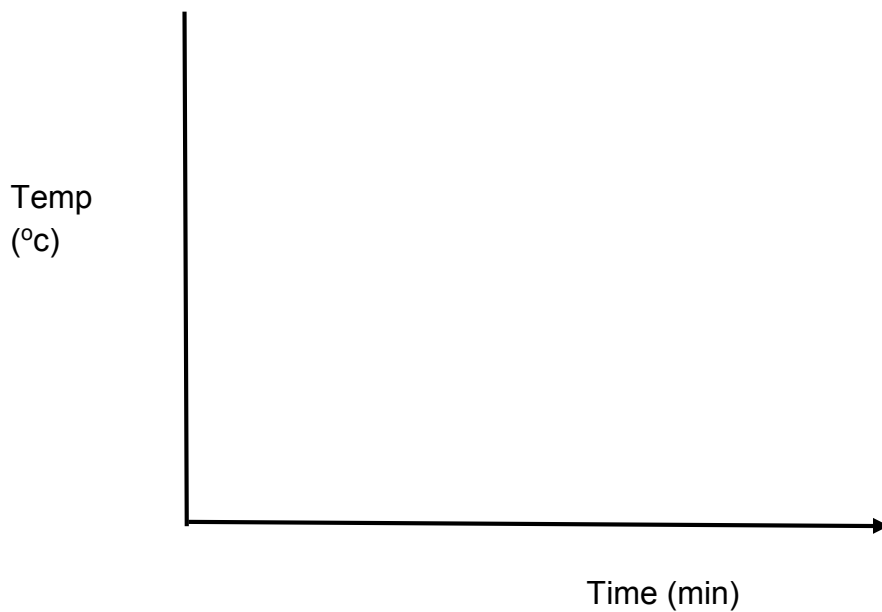
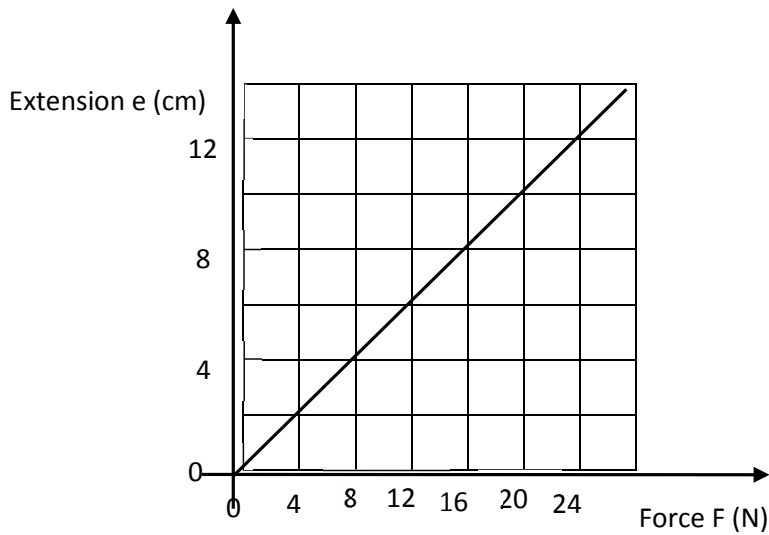


Figure 4

(2marks)

10. The graph shows variation of extension and stretching force F for a spring which obeys Hooke's law.



(i) Determine the spring constant in SI units. (1mark)

(ii) The energy stored when the extension is 20cm. (2marks)

11. (a) An aero plane 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. (1mark)

(b) **Figure 5** shows parts A, B and C of a glass tube.

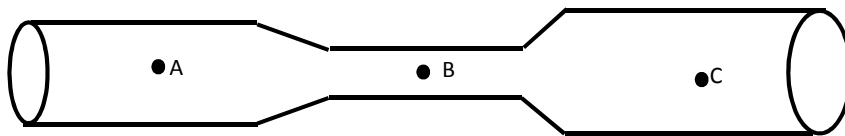


Figure 5

State with a reason the part of the tube in which the pressure will be lowest when air is blown through the tube from A towards C. (2marks)

Section B (55 marks)

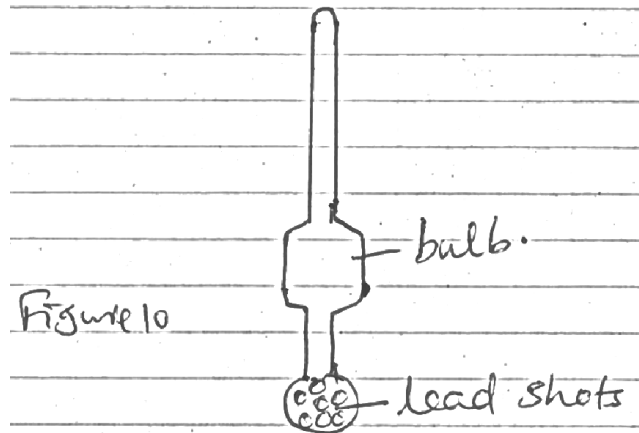
1. Answer ALL the questions in the spaces provided

12.

(a) State Archimedes' principle

(1 mark)

(b) Figure 10 below shows an hydrometer



(i) What is the purpose of this instrument

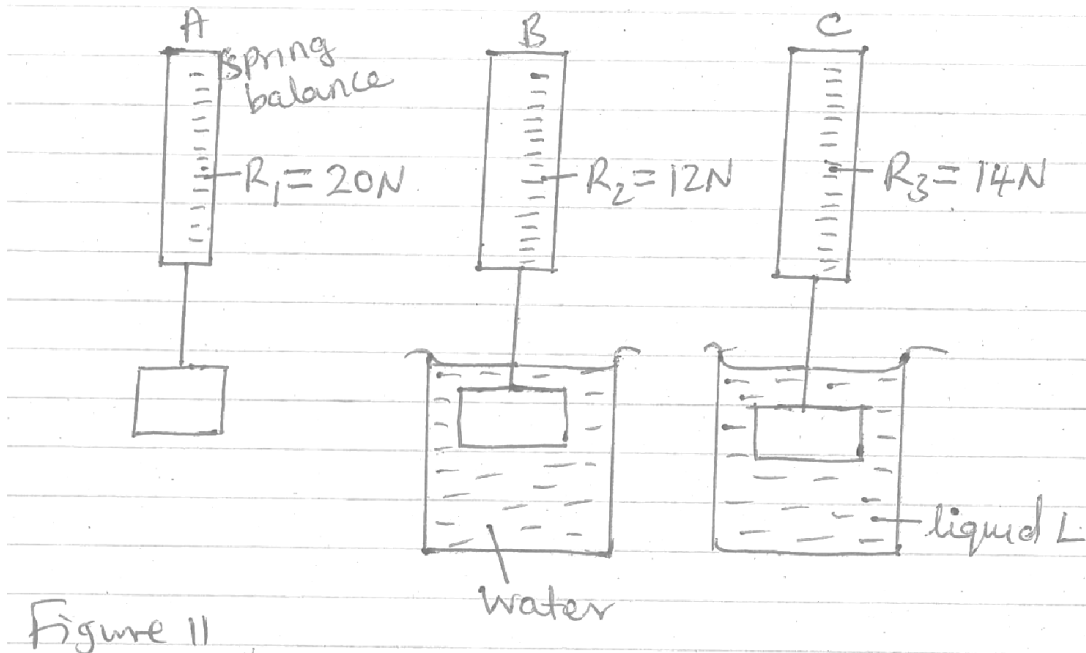
(1 mark)

(ii) What is the use of the lead shots at the base of the instrument (1 mark)

(iii) Why would the bulb have a large volume?

(1 mark)

(c) The set up shown below was used by a student to determine the density of a liquid.

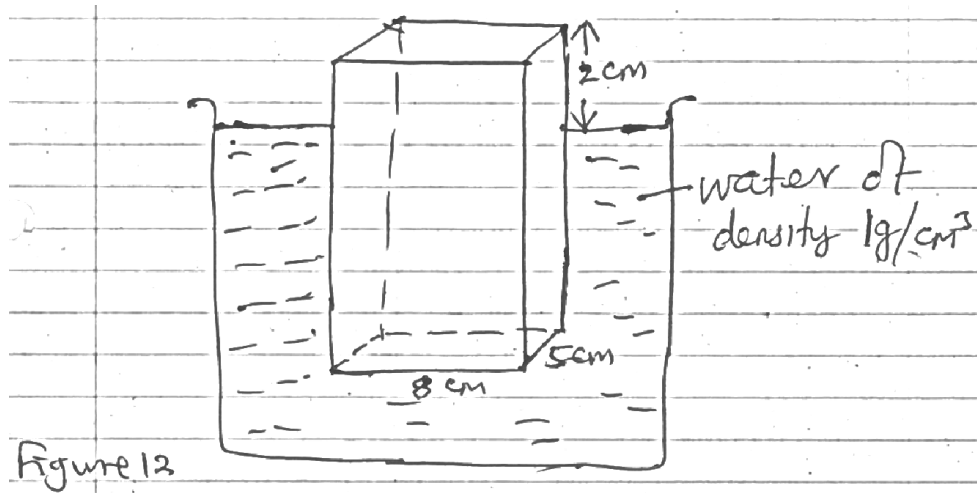


Use the information from the set up above to calculate.

(i) The density of the solid (3 marks)

(ii) The density of liquid L (3 marks)

(d) Figure 12 below shows a solid measuring 8cm by 5cm and of height 10cm

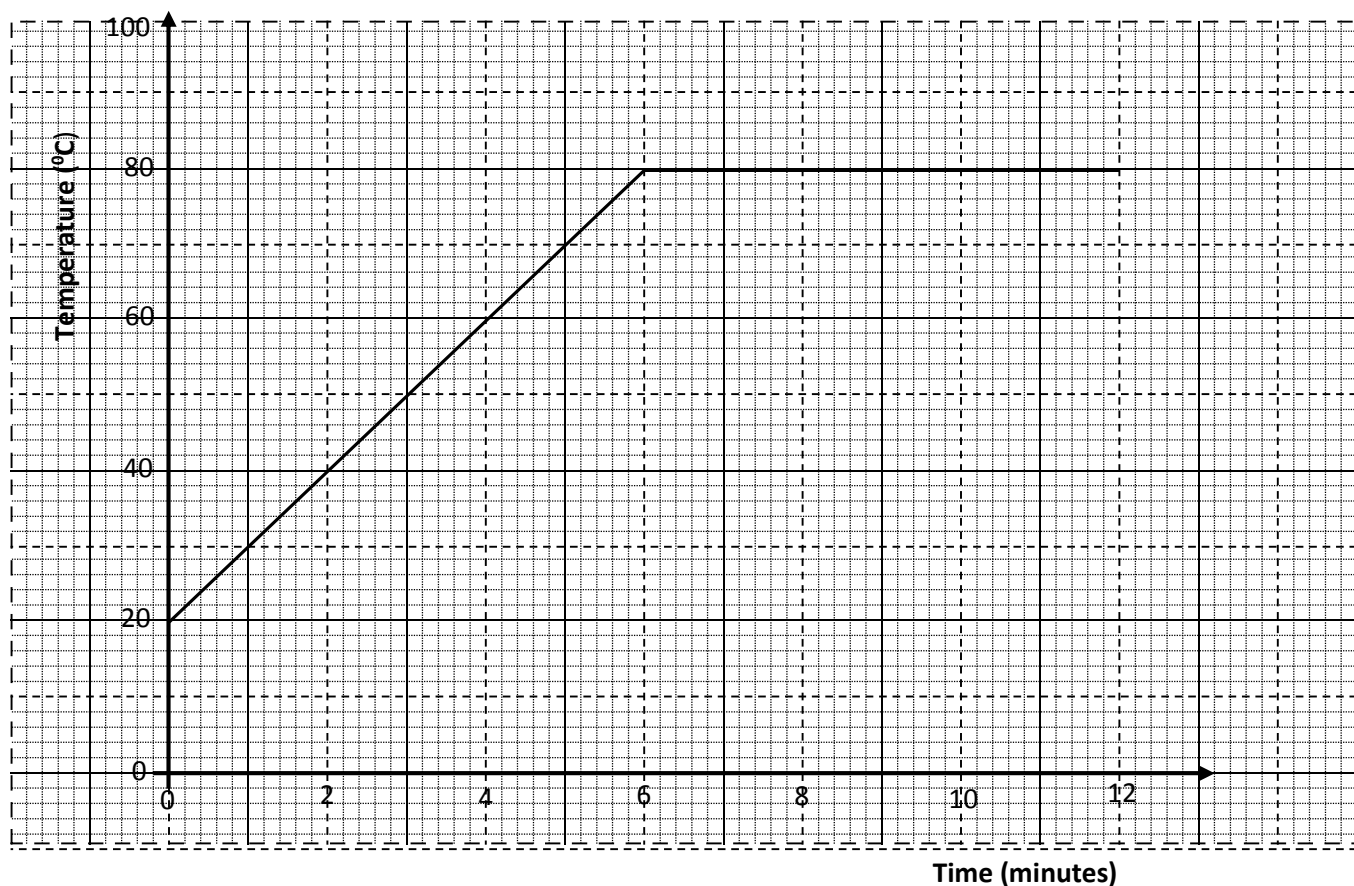


Calculate the force that should be applied to the block so as to get completely submerged. **(4 marks)**

13(a) State **two** differences between boiling and evaporation.

(2marks)

(b) 1200 g of a liquid at 20°C is poured into a well-lagged calorimeter. An electric heater rated 1 KW is used to heat the liquid. The graph below shows the variation of temperature of the liquid with time.



Use the graph below to answer the following questions:

- (i) What is the boiling point of the liquid? (1mark)
- (ii) How much heat is given out by the heater to take the liquid to the boiling point? (2marks)
- (iii) Determine the specific heat capacity of the liquid stating any assumptions made. (3marks)
- (iv) If 50 g of the liquid vapour was collected by the end of the 10th minute, determine the specific latent heat of vaporization of the liquid. (3marks)

14 (a) State Boyle's law.

(1mark)

(b) A bicycle pump, with its exit hole closed 80 cm^3 of air at 760 mmHg pressures and a temperature of 7° C . When the air has been compressed to 38 cm^3 under 1720 mmHg pressure, its temperature rises.

(i) Calculate the rise in temperature.

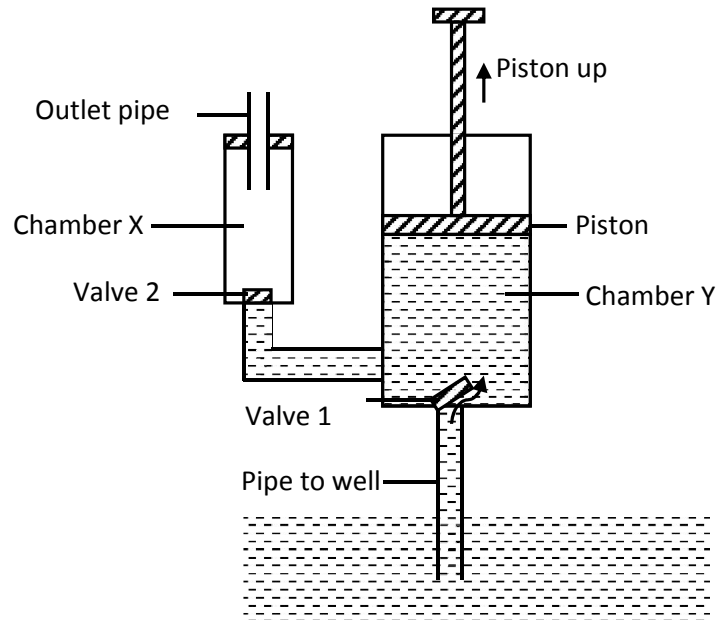
(3marks)

(ii) Explain why the temperature rises.

(1mark)

(c) **Figure 5** below shows a force pump

Figure 5



- (i) Explain why when the piston is pulled upwards valve 1 opens and valve 2 closes. (2marks)
- (ii) Explain how continuous flow of water is maintained in the pump. (1mark)
- (d) State **one** advantage of force pump over lift pump. (1mark)

15. (i) State **two** factors affecting centripetal force. (2mks)

(ii). The setup in figure 5 below shows a 50g mass being whirled on a horizontal circular path and balanced by hanging mass M.

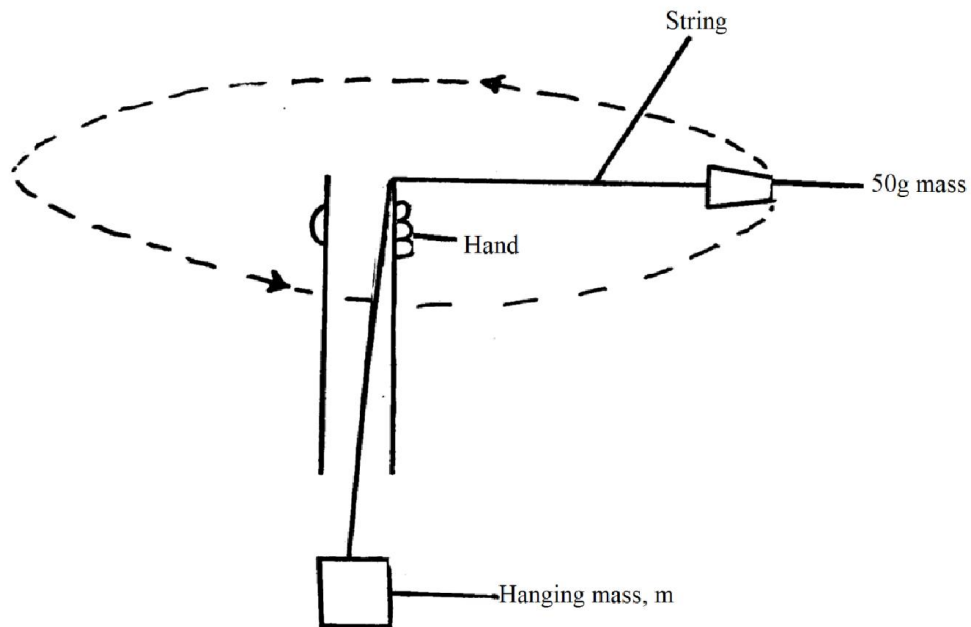


Figure 5

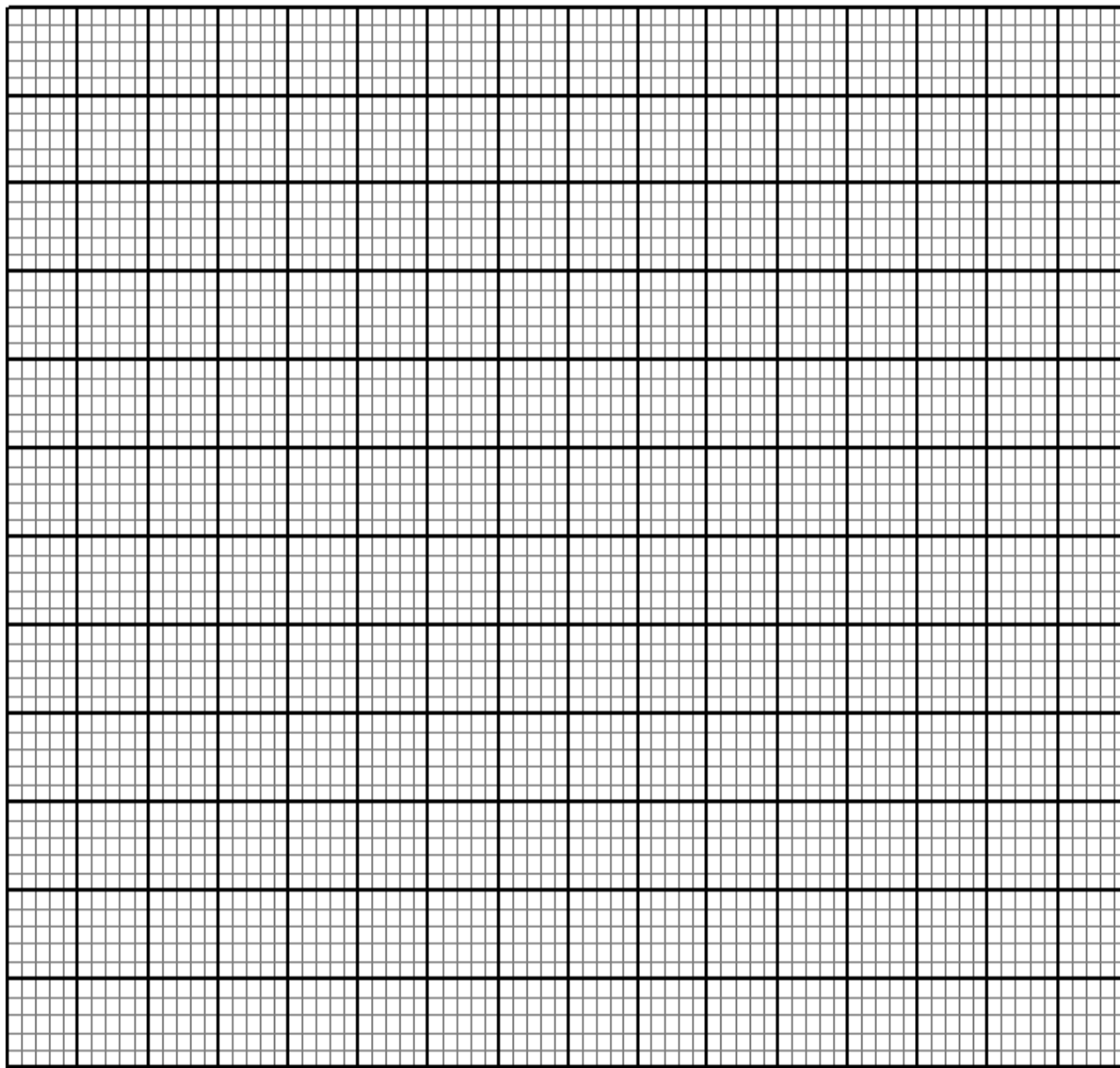
Rotich used the above setup to investigate the variation of periodic time, T and the radius, r of the path of the 50g mass and obtained the result shown in the table 1.

Radius, r (m)	0.50	0.41	0.33	0.24	0.16
Periodic time, T (s)	0.99	0.90	0.81	0.69	0.56
T² (s²)					

(a) Complete the table

(1mk)

(b) Use table 1 above to draw the graph of T^2 against r on the grid provided (5mks)

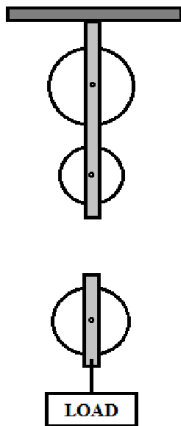


c) From the equation $T^2 = \frac{4\pi^2 m r}{F}$, determine from the graph the value of the force, F that keeps the 50g mass in the horizontal circular path (i.e $m = 50\text{g}$) (4mks)

16. (a) Name a device used to convert light energy directly into electrical energy. (1 mark)

(b) A girl whose mass is 60 kg runs up a flight of 20 steps each 15 cm in 40 seconds. Calculate the power developed by the girl. (2 marks)

(c) (i) The figure below shows an incomplete arrangement of the pulley. Draw on the diagram the string arrangement that would give a velocity ratio of 3. (1 mark)



(ii) The pulley system is used to raise a load of 160 N through a distance of 40m. If the effort applied is 80N, determine

a) Mechanical advantage (2 marks)

b) Efficiency of the pulley system (3 mark)