NAME: …… INDEX NO: ……

SCHOOL: …… DATE : ……

SIGNATURE: ……

232 / 1
PHYSICS
PAPER 1
THEORY
JULY / AUGUST 2013
TIME: 2 HOURS

NANDI NORTH DISTRICT JOINT MOCK EVALUATION TEST 2013

Kenya Certificate of Secondary Education (KCSE)
PHYSICS
PAPER 1
TIME: 2 HOURS

INSTRUCTIONS TO CANDIDATES:

(a) *Write your Name and Index Number in the spaces provided.*

(b) *Sign and write the date of examination in the spaces provided above.*

(c) *This paper consists of two sections A and B.*

(d) *Answer all questions in Section A and B in the spaces provided.*

(e) *All working MUST be clearly shown.*

(f) *Mathematical tables and electronic calculators may be used.*

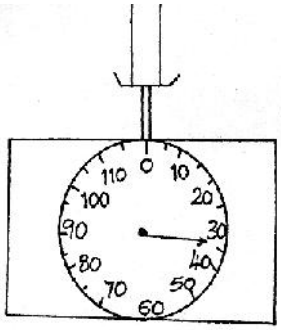
FOR EXAMINER'S USE ONLY

SECTION	QUESTION	MAX. SCORE	CANDIDATE SCORE
A	1 - 11	25	
B	12	10	
	13	11	
	14	11	
	15	13	
	16	10	
TOTAL SCORE		**80**	

SECTION A (25 MARKS)

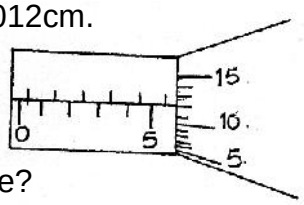
Answer ALL questions in this section in the spaces provided

1. The figure below shows an empty beaker placed on the top of a pan calibrated in grammes.



50ml of alcohol of density 0.8g/cm^3 was added to the beaker. Show on the diagram the new pointer position.

2. The diagram below shows a portion of a micrometer screw gauge used to measure the diameter of a metal pipe. The reading on the gauge when the jaws were fully closed without the pipe was 0.012cm.



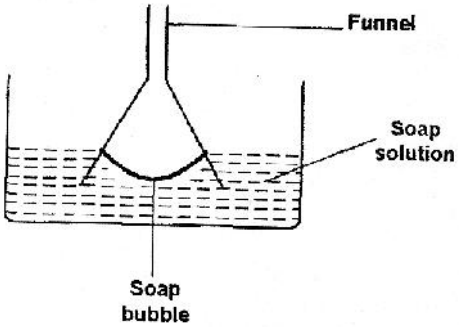
What is the diameter of the pipe? (2mks)

3. Given that the length of the pipe in 2 above was 1.20cm, find its volume. (1mk)

4. (a) What is surface tension? (1mk)

(b) Figure 2 below shows a funnel dipped into a liquid soap solution.

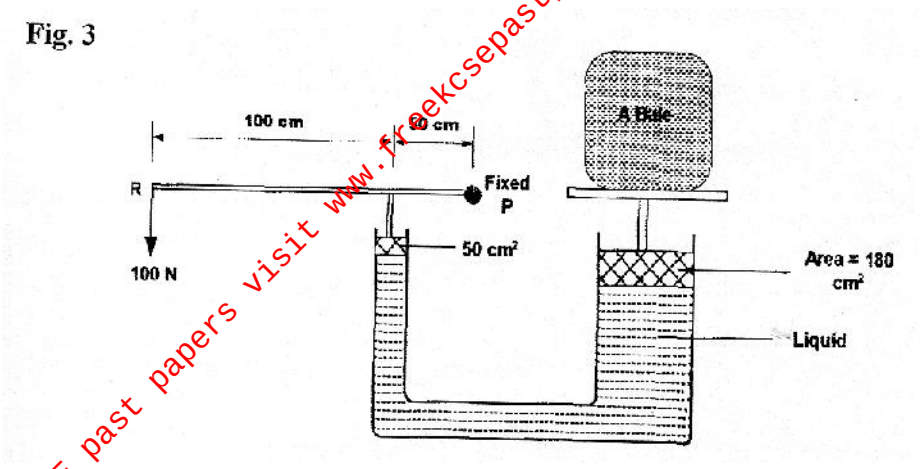
Fig. 2



Explain what happens to the soap bubble when the funnel is removed. (1mk)

Figure 3 shows a hydraulic press system using a lever of negligible mass on the side of a small piston pivoted at point P. A force of 100N is applied at R.

Fig. 3



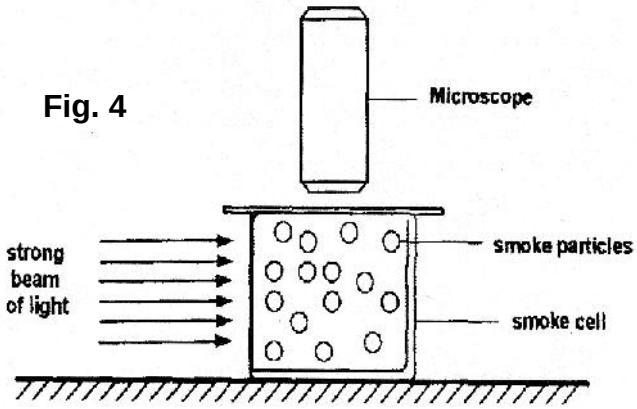
Use this information to answer question 5 and 6.

5. Calculate the force F exerted by small piston on the liquid. (2mks)

6. Find the weight of the Bale supported by the large piston. (2mks)

7. Figure 4 shows apparatus used to observe the behaviour of smoke particles in a smoke cell.

Fig. 4

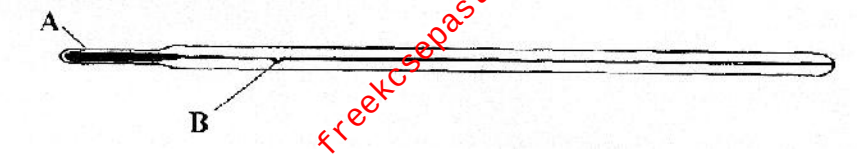


(a) Explain what was observed. (1mk)

(b) Explain what happens if the temperature was raised. (1mk)

Figure 5 shows a clinical thermometer which is not graduated.

Fig. 5

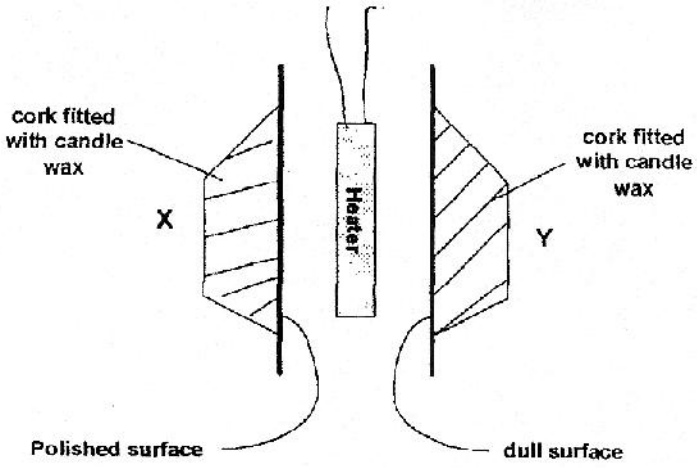


(c) Name the parts indicated with letters: A and B. (1mk)

(d) Mark the appropriate scale range in degrees Celsius. (1mk)

8. Figure 6 shows two corks X and Y fixed on a polished plate and a dark plate with candle wax.

Fig. 6



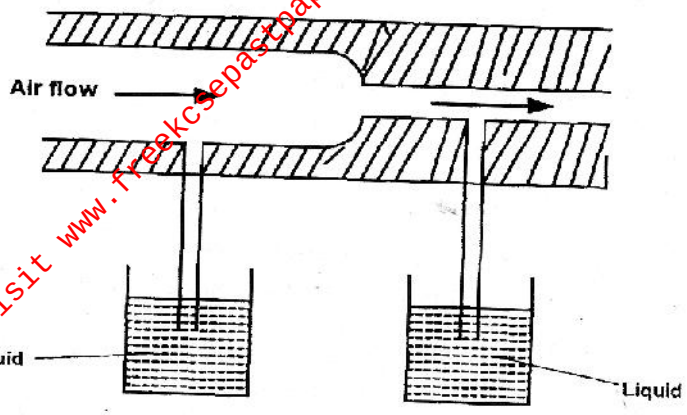
Explain the observation, when the heater is switched on for a short time. (2mks)

9. (a) The stability of a body can be increased by increasing the base area and lowering its centre of gravity. State **one** way of lowering its centre of gravity. (1mk)

Figure 7 shows air flowing through a pipe of non-uniform cross-sectional area. Two

pipes A and B are dipped into liquids as shown.

Fig. 7

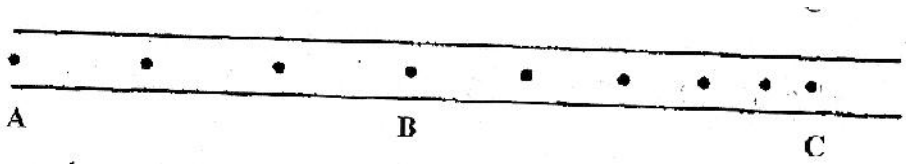


(b) Indicate the levels of the liquids in pipe A and pipe B. (1mk)

(c) Explain your answer in (a) above. (1mk)

10. Figure 8 shows dots which were made by a ticker timer-tape attached to a trolley (drawn to scale).

Fig. 8



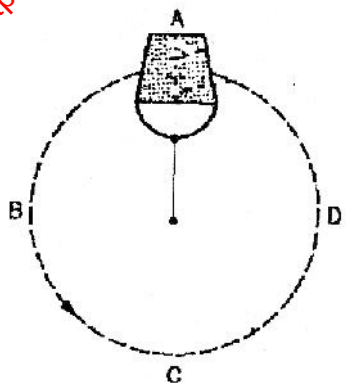
If the frequency used was 50Hz, determine:-

(a) The velocities between AB and BC. (2mks)

(b) The deceleration of the trolley. (2mks)

11. Figure 9 shows a pail of water being swung in a vertical circle. (2mks)

Fig. 9



Explain why the water does not pour out when the pail is at position A as shown.

(1mk)

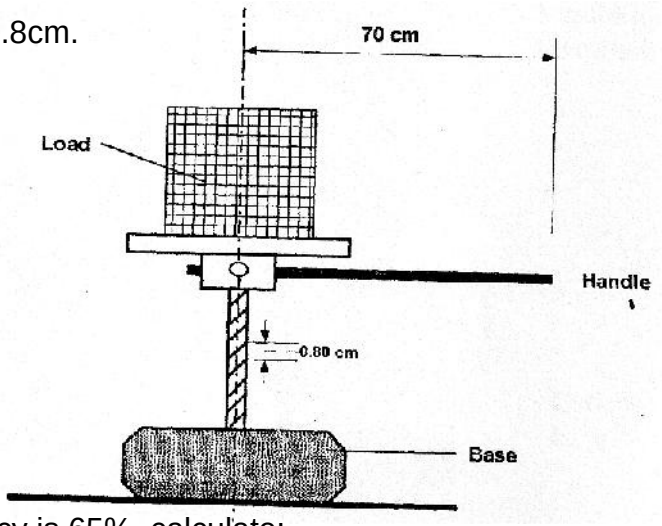
SECTION B (55 MARKS)

Answer ALL questions in this section in the spaces provided

12. (a) A rifle of mass 4.0kg fires a bullet of mass 12.0g with a muzzle velocity of $700ms^{-1}$. Assuming that the rifle is free to move, find the velocity of recoil. (3mks)

(b) Figure 10 shows a cross-section of a handle of a screw jack 70cm long. The pitch of the screw is 0.8cm.

Fig. 10

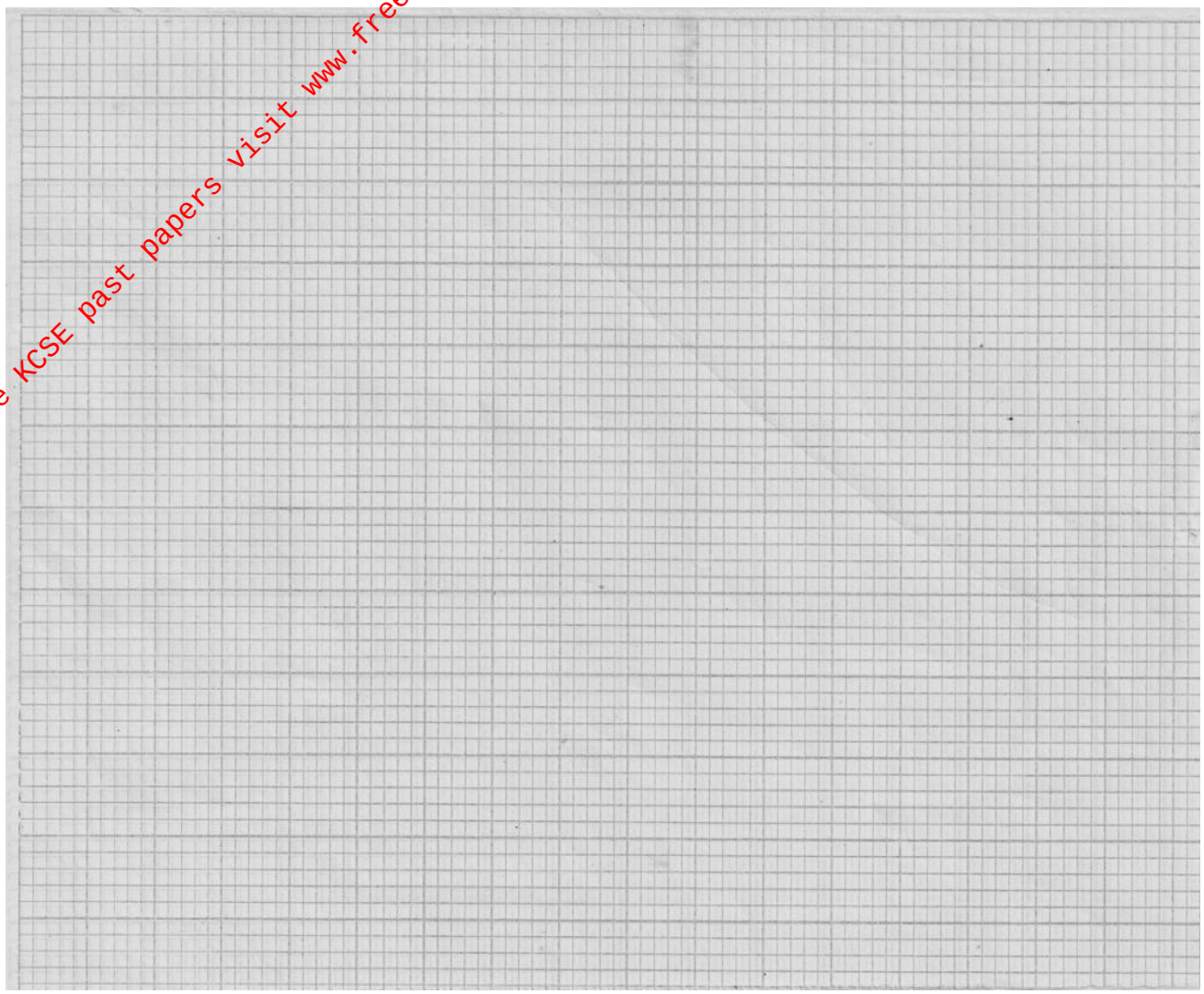


Given that the efficiency is 65%, calculate:-

(i) The velocity ratio of the system (2mks)

(ii) The mechanical advantage of the screw jack. (2mks)

(c) Sketch a graph of efficiency against Load. (2ms)



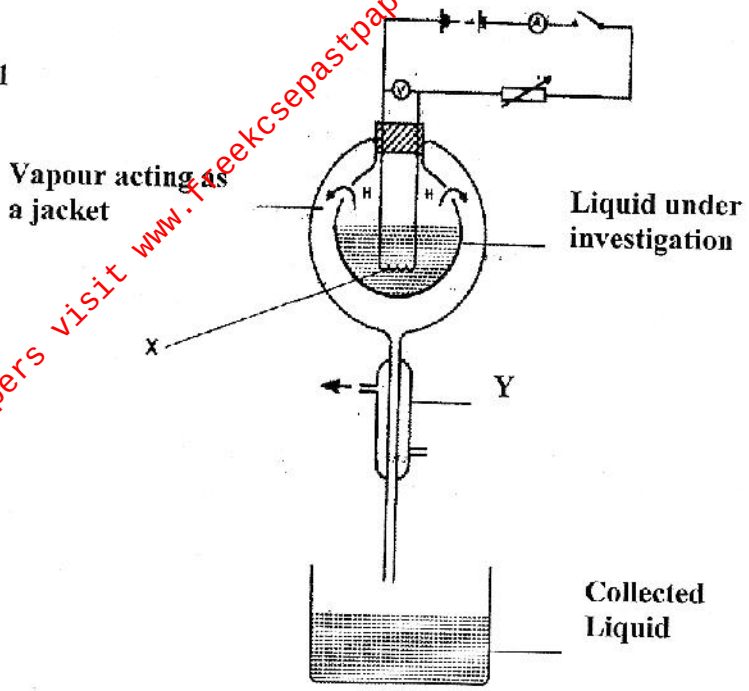
(d) Draw a single moving pulley with a velocity ratio of 2. (2ms)

13. (a) Define latent heat of vaporization. (1mk)

(b) Figure 11 shows a set up by a student to determine the specific latent heat of

vaporization of a liquid.

Fig. 11



(i) Identify the parts labeled X and Y. (2mks)

(ii) State the measurements that should be taken. (2mks)

(iii) Describe how the set up can be used to determine the specific latent heat of vaporization of the liquid. (5mks)

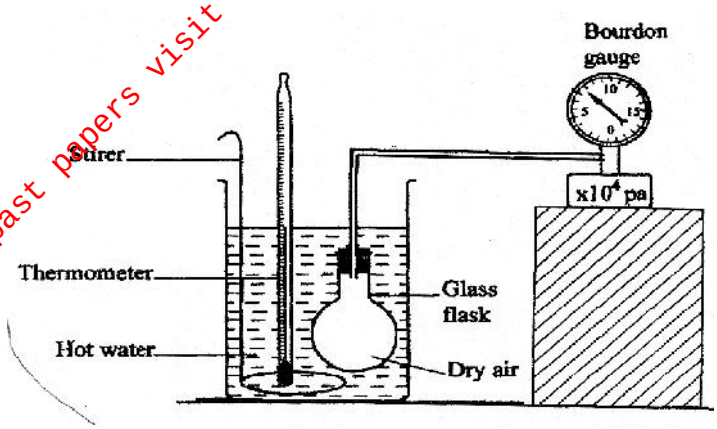
(iv) What is the purpose of the condenser? (1mk)

14. (a) Define Pressure Law. (1mk)

(b) State **one** basic assumption of the Kinetic Theory of gases. (1mk)

(c) Figure 12 shows a set up that may be used to verify Pressure Law.

Figure 12



(i) State the measurements that may be taken in the experiment. (2mks)

(ii) Explain how the measurement in (i) above may be used to verify Pressure Law. (4mks)

(iii) A car tyre is at an air pressure of 4.0×10^5 Pa at a temperature of 27^0C. While it is running, the temperature rises to 75^0C. What is the new pressure in the tyre? (Assume the tyre does not expand). (3mks)

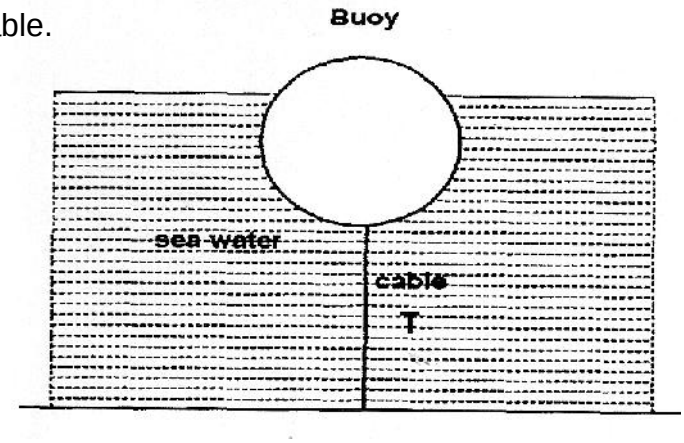
15. (a) (i) State Archimedes's Principle. (1mk)

(ii) An object weights 1.04N in air, 0.64N when fully immersed in water and 0.72N when fully immersed in a liquid. If the density of water is $1000kgm^{-3}$, find the density of the liquid. (4mks)

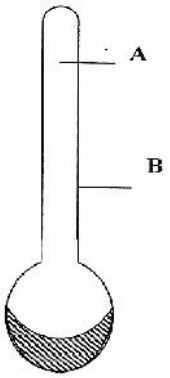
(b) (i) State the Law of floatation. (1mk)

(ii) Give a reason why a steel rod sinks in water while a ship made of steel floats on water. (1mk)

(c) Figure 13 shows a buoy, B, of volume 40 litres and mass 10kg. it is held in position in sea water of density $1.04gcm^{-3}$ by a light cable fixed to the bottom so that ¾ of the volume of the buoy is below the surface of the sea water. Determine the tension T in the cable. (4mks)



(d) The figure below shows a diagram of a hydrometer which is suitable for measuring the densities of liquids varying between 1.0 and $1.2gcm^{-1}$.



On the diagram indicate the label corresponding to 1.0 and 1.2g/cm^3. (2mks)

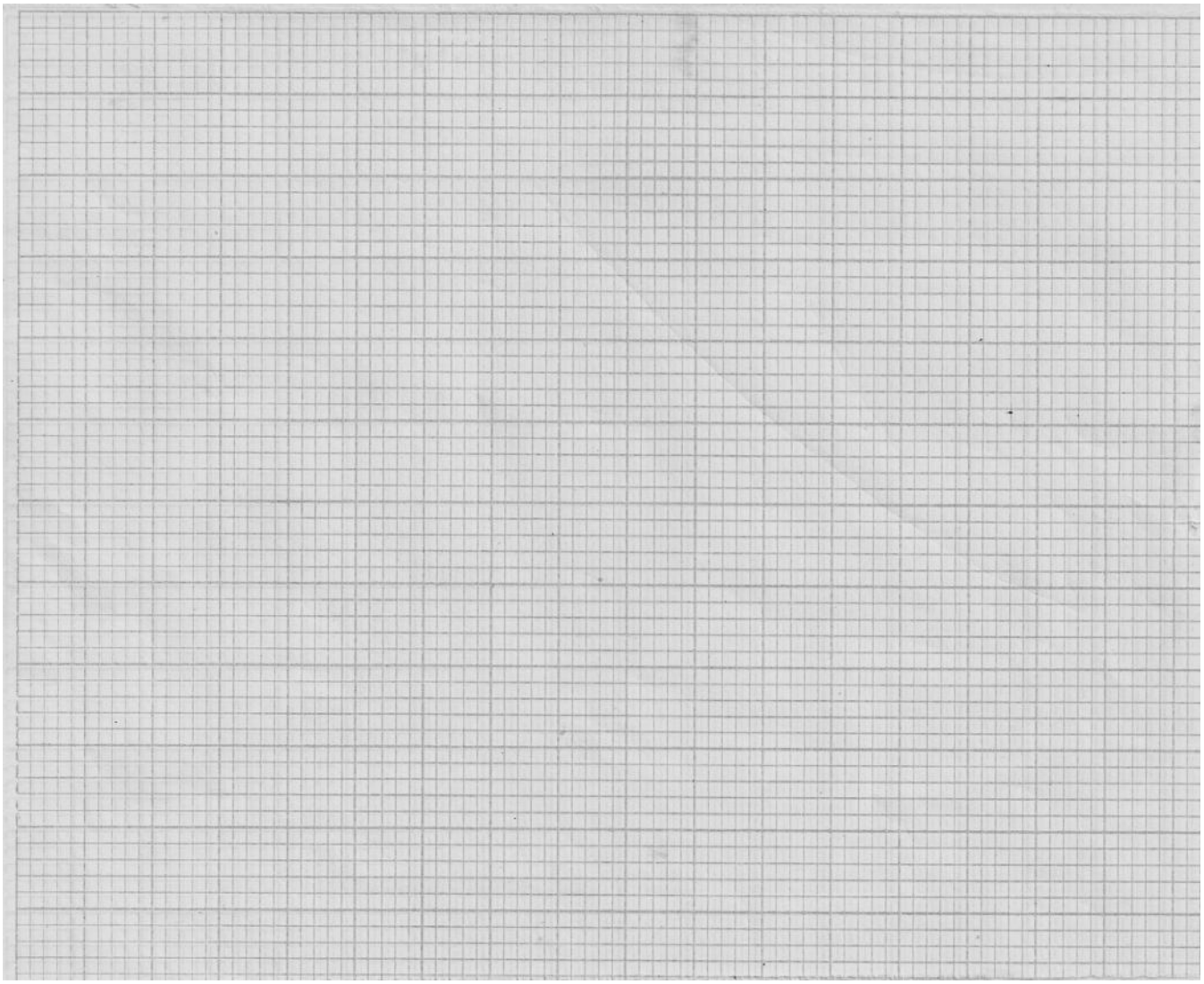
16. (a) State Hooke's law. (1mk)

(b) The following results were obtained in an experiment to verify Hooke's law when a spring was extended by hanging various loads on it.

Load, L (N)	0.00	1.00	2.00	3.00	4.00	5.00	6.00
Length of spring (cm)	10.00	11.50	13.00	14.50	16.00	18.50	24.00
Extension, e (cm)	0.00						

(i) Complete the table for extension, e, above. (1mk)

(ii) Plot a graph of Load (y-axis) against extension. (5mks)



(iii) From the graph, determine the spring constant, k. (3mks)