F2 ENDYEAR ASSIGNMENT

PHYSICS

10+ HOLIDAY ASSESMENT PAPERS

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FORM 2 EXAMINATION TRIALS

PHYSICS

PRACTICE TEST 1

TIME: 2 HOURS

NAME…….. ADM NO…….....

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Answer All the questions in the spaces provided

1. Express each of the following volumes in SI unit giving your answer in standard form **(2marks)**

a) $25000cm^3$

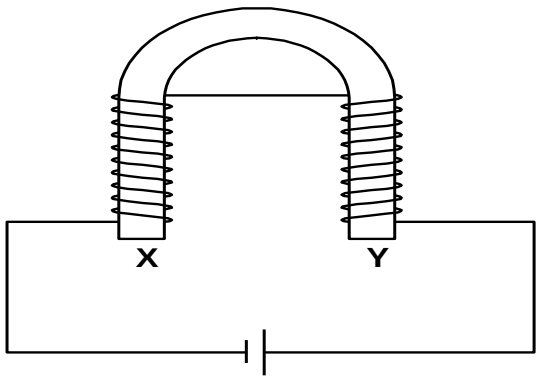
b) $0.5675cm^3$

2. State the law of magnetism**.** **(1mark)**

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3. The figure shows an electromagnet. State the polarities at X and Y. **(2 marks)**



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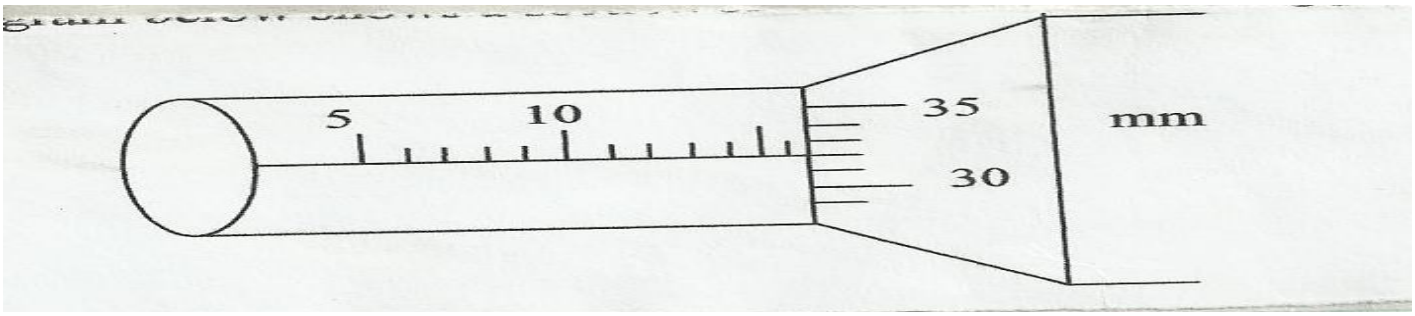
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4. Dust particles in air appear to move randomly, explain this observation**.** **(1 marks)**

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5. The diagram below shows a section of a micrometer screw gauge.



a) State the smallest measurement that can be made by the measurement that can be made by the micrometer screw gauge**.** **(1 mark)**

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b) What is the correct reading of the micrometer screw gauge if it has an error of 0.25cm **(3 marks)**

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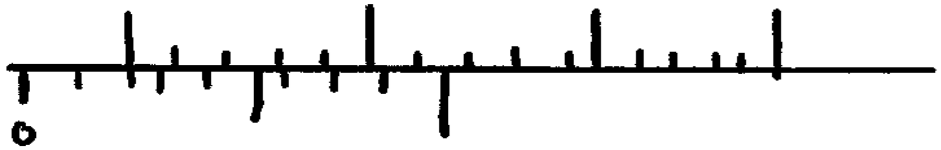
6. State two properties of magnetic field lines **(2marks)**

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7. A charge of 180coloumbs flows though a lamp every minute. Calculate the current flowing through the lamp **(3marks)**

8. The figure below shows part of a vernier caliper when the jaws are closed without an object between the jaws



a) What is the value of the zero error of the calipers**?** **(1mark)**

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b) A student used the same vernier calipers in (a) above to measure the diameter of a test tube whose actual diameter is 2.15cm. What was the reading shown by the calipers **(3marks)**

9. Explain why repulsion is then sure test for polarity of a magnet **(1mark)**

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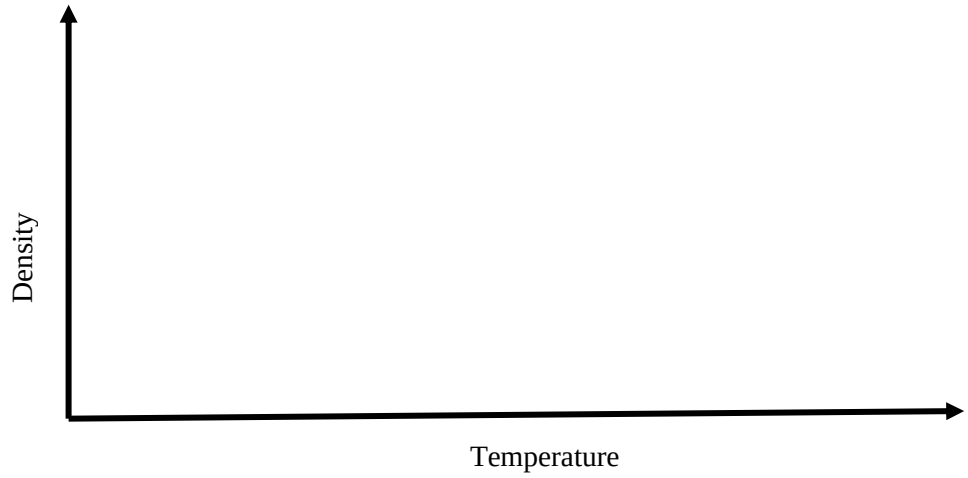
10. Explain why a gold leaf is electroscope casing is made up of metal **(1mark**

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11. Use domain theory to explain the difference between magnetic and non magnetic materials **(2marks)**

12. On the graph provided, sketch a graph of density against Temperature of a given mass of water(2 marks)



13. State two properties of a good thermometric fluid **(2marks)**

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14. State one application of magnets**.** **(1mark)**

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15. State the laws of reflection **(2mks)**

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FORM 2 EXAMINATION TRIALS

PHYSICS

PRACTICE TEST 2

TIME: 2 HOURS

NAME…….. ADM NO…….....

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SECTION 1

ANSWER ALL QUESTIONS (5OMKS)

1. The figure 1 below shows a micrometer screw gauge used to measure the diameter of a piece of wire.

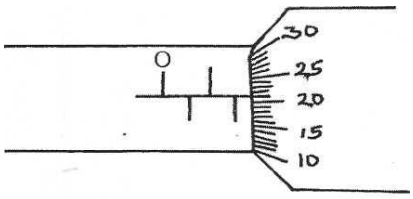


Figure 1

i. Determine the reading on the scale of the micrometer screw gauge **(2mks)**

ii. If the micrometer screw gauge has an error such that if the jaws are closed without any object, it reads 0.04mm below the centre line of the sleeve, determining the actual cross sections area of the of wire. **(2mks)**

2. Distinguish between heat and temperature. **(2mks)**

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3. State one disadvantage of using a pin hole camera to take photographs **(1mk)**

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4. In an oil drop experiment a student estimated the dimeter of the oil patch to be 0.16m, given that the volume of the oil drop was $0.048cm^3$.

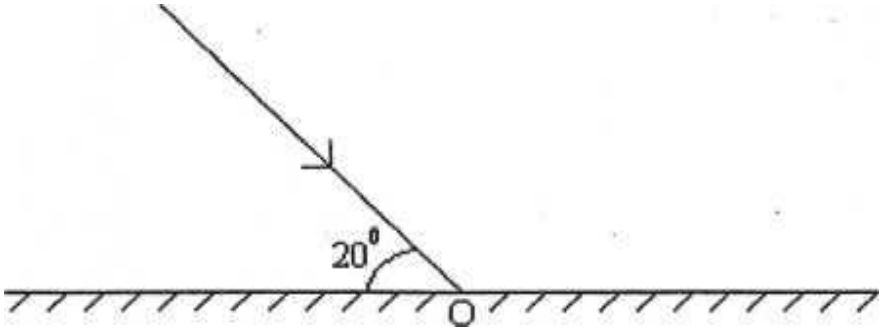
Determine the thickness of the oil patch

State an assumption made in the above calculations **(1mk)**

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5. A ray of light makes an angle of 20^0 with a plane mirror as shown in figure 2 below.



Determine the angle of reflection **(2mks)**

6. Give a reason why fuel tanks of Kenya Pipeline Company are silvery painted **(1mk)**

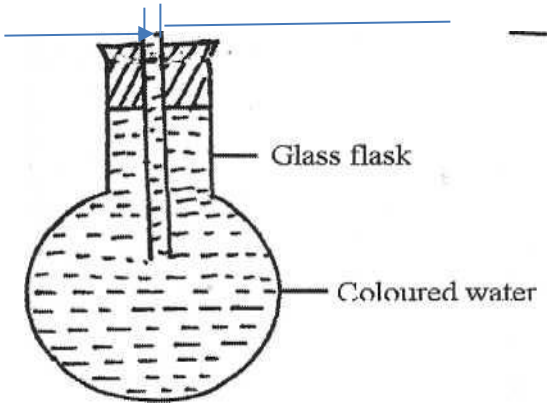
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7. The figure 3 below shows a flask filled with coloured water. The rubber cork is pushed in until the in water rises a short distance in the glass tube.

Glass tube

Water level



State and explain what is observed when the flask is placed in a hot water bath **(2mks)**

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8. Two identical sphered A and B each standing on an insulating base are in contact. A negatively charged rod is brought near sphere A as shown in figure 4

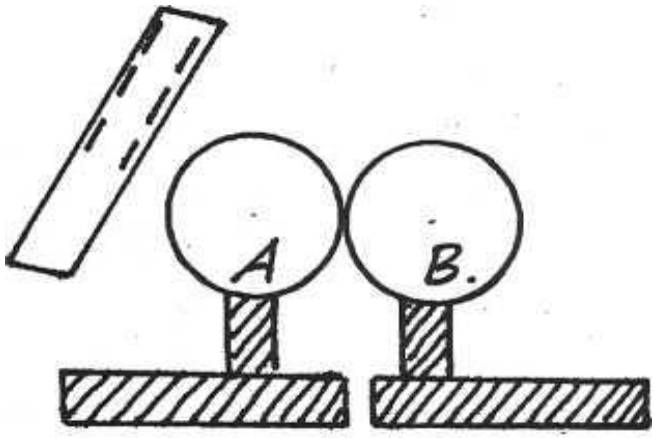


Figure 4

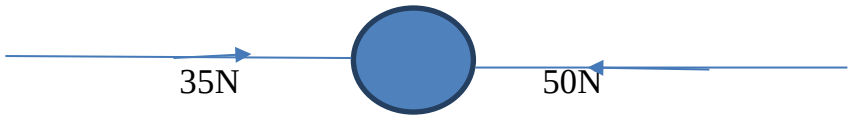
State and explain the charged acquired by A and B **(2mks)**

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9. Sketch a diagram to show the direction and magnitude of the resultant force for two forces acting as shown in figure 5 below **(1mk)**



10. In an experiment to demonstrate Brownian motion, smoke was placed in an air cell and observed under a microscope. Explain the observation. **(2mks)**

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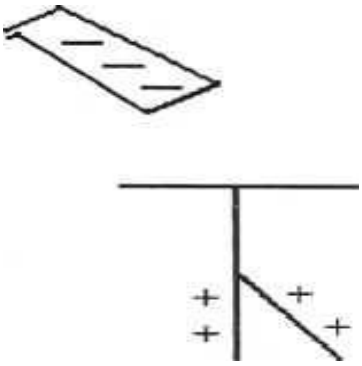
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11. What property of light is illustrated by formation of shadows? **(1mk)**

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12. State and explain the observation on the leaf of a positively charged when a negative charge is brought close to cap as shown in figure below. **(2mks)**



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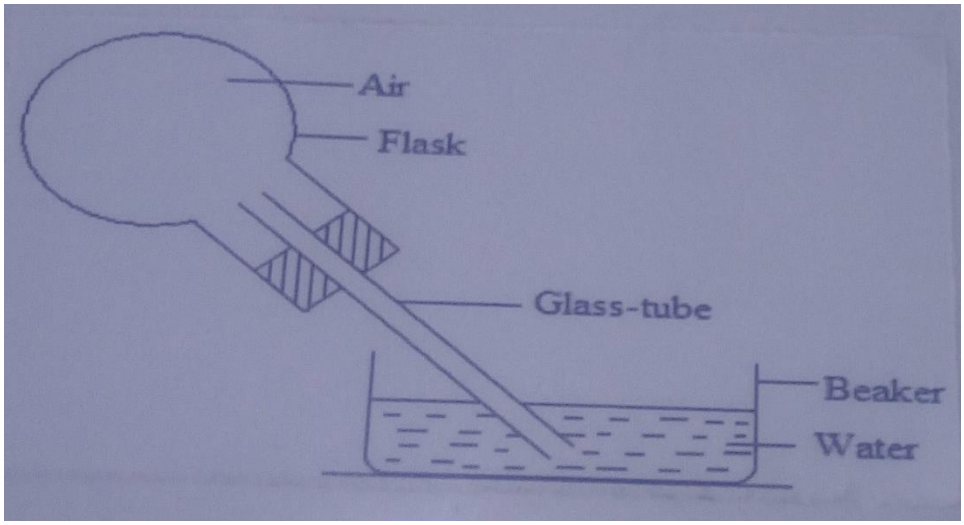
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13. Suggest a reason why a person who has lost one leg is provided with crutches. **(1mk)**

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14. Figure 7 below shows a flash with a glass tube dipped into a beaker containing water at room temperature. The cork fixing the glass tube is tight.



State with reason what would be observed if cold water is poured on to the flash **(2mks)**

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15. i) Convert 27^0C TO Kelvin **(1mk)**

ii) What is meant by absolute zero temperature? **(1mk)**

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16. Figure 8 shows a clinical thermometer which is not graduated

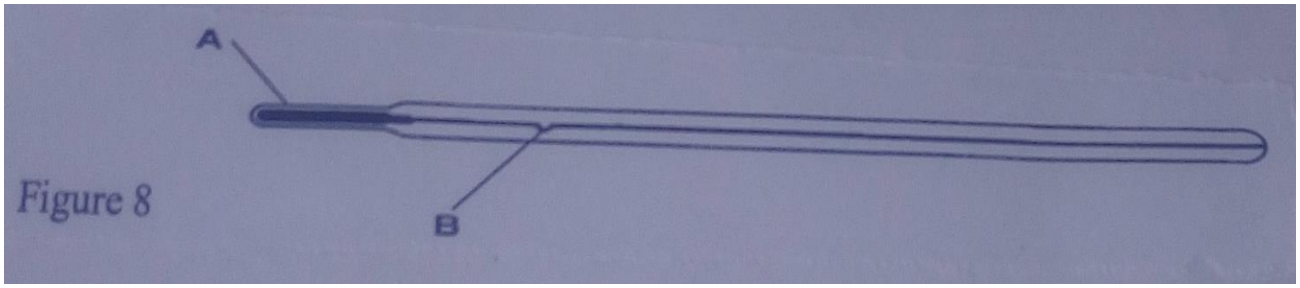


Figure 8

Name the parts indicate with letters: A and B **(2mks)**

A ……

B ……

Mark the appropriate scale range in degrees Celsius **(2mks)**

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17. The reading on a mercury barometer at Mombasa is 760mm. Calculate the pressure at Mombasa. (Density of mercury is $1.36\times 10^{4}Kgm^{-3}$) **(3mks)**

18. Name two advantages which a lead accumulator has over a dry cell **(2mks)**

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19. A girl observed her in a concave mirror of a focal length 90cm. If the mirror is 70cm away. State two characteristics of the image observed. **(2mks)**

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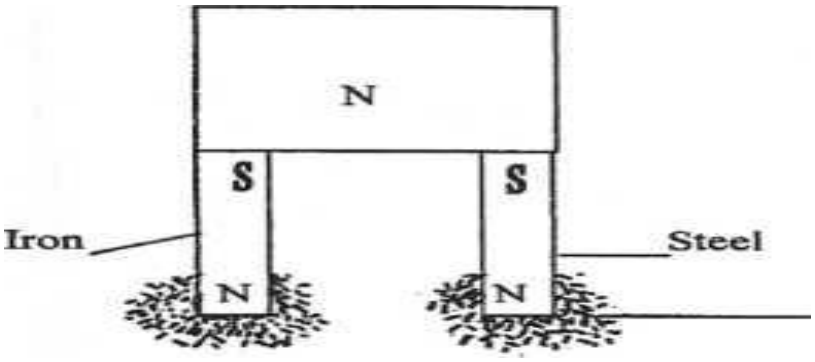
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20. Why is topping of an accumulator done with distilled water and not sulphuric acid? **(1mk)**

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21. The figure 9 below shows iron and steel rods placed in contact with a magnet.



State with a reason what is observed when this magnet is removed from the rods **(2mks)**

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22. Why is concave mirrors used as a saloon mirror? **(1mk)**

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23. An old man warming himself next to a Jiko received heat mostly by radiation. Explain why. **(2mks)**

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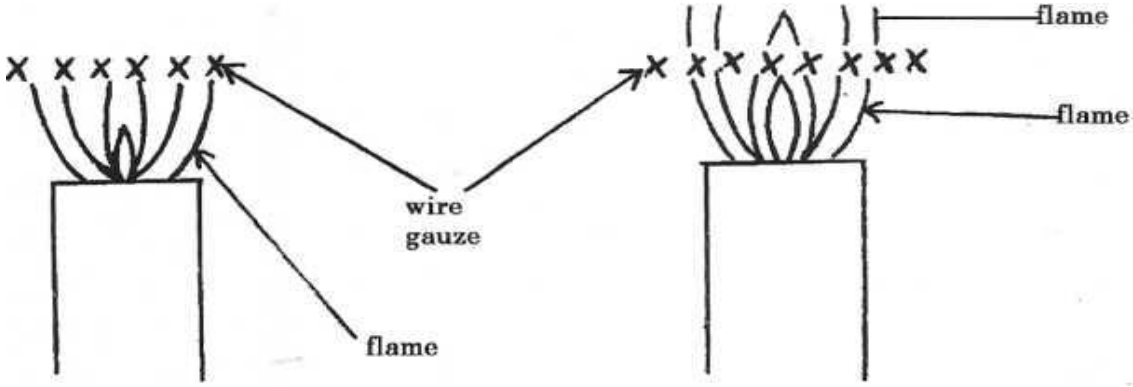
24. You are provided with two iron bars M and N one is magnetized and the other is not. Explain how you would identify the magnetized bar. **(2mks)**

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25. When a Bunsen burner is lit below wire gauze, it is noted that the flame initially burns below the gauze as shown in the figure below. After sometimes the flame burns below as well as shown in the figure below. After sometime the flame burns below as well as above the gauze.



Explain this observation **(2mks)**

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SECTION B (50MKS)

Answer all questions in this section in the spaces provided

26. a) The water level in a burette is 27cm^3. If 88 drops of water fall from the burette and the average volume of one drop is 0.25cm^3.what is the final water level in the burette? **(2mks)**

b) In an experiment to determine the density of sand using a density bottle, the following measurements were recorded.

Mass of empty density bottle = 38.3g
Mass of density bottle of water = 64.7g
Mass of density bottle with some sand = 66.6g
Mass of density bottle with sand filled up with water = 84.2g

Take density of water as 1g/cm^3
Use the above data to determine the:

a) Mass of water that completely filled the bottle **(1mk)**

b) Volume of water that completely filled the bottle **(2mks)**

c) Volume of the density bottle **(1mk)**

d) Mass of sand **(1mk)**

27. a) One of the factors that affect the surface tension of a liquid is the presence of impurities. State the other factor. **(1mks)**

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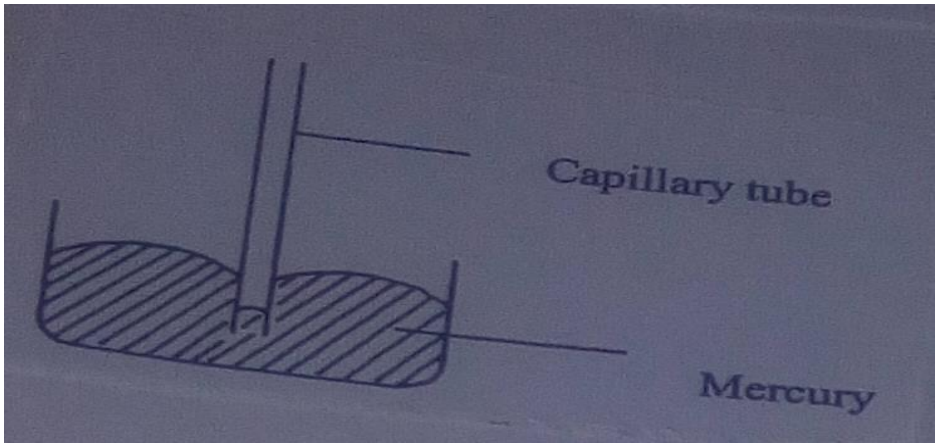
b) A solid weighs 20.5N on the surface of the moon. The force of gravity on the moon is $1.86Nkg^{-1}$. Determine the mass of the solid **(3mks)**

16. State the reason why wick lamps are usually made of cotton **(1mk)**

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17. The diagram below shows the behavior of mercury in a capillary tube. Explain the behavior **(1mk)**



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28. a) Use simple sketches to show the three states of equilibrium

Name the states **(3mks)**

(i)

(ii)

(iii)

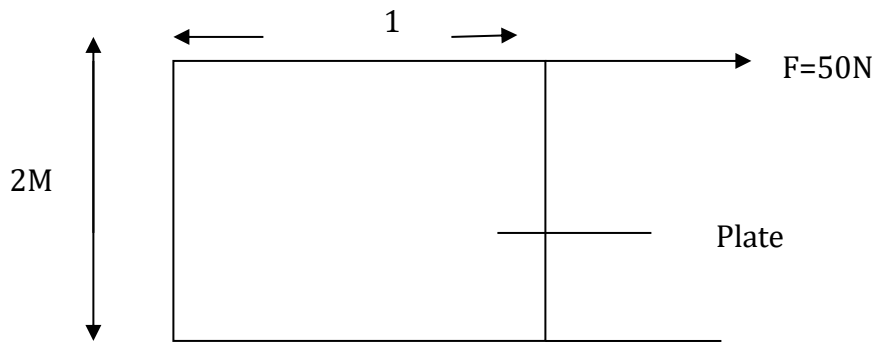
b)Kathurima was carrying a heavy luggage using one hand. It was observed that the leans away from the luggage. Explain this observation. **(2mks)**

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c) The figure 8 below shows a metal plate 2m long.1m wide and negligible thickness.A horizontal forces of 50 Nis applied at point A just makes the plate tilt.



Calculate the weight of the plate **(3mks)**

29. a) i) Define the term pressure and state its SI units **(1mk)**

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ii) It is not possible to use a drinking straw in a vacuum. Explain **(1mk)**

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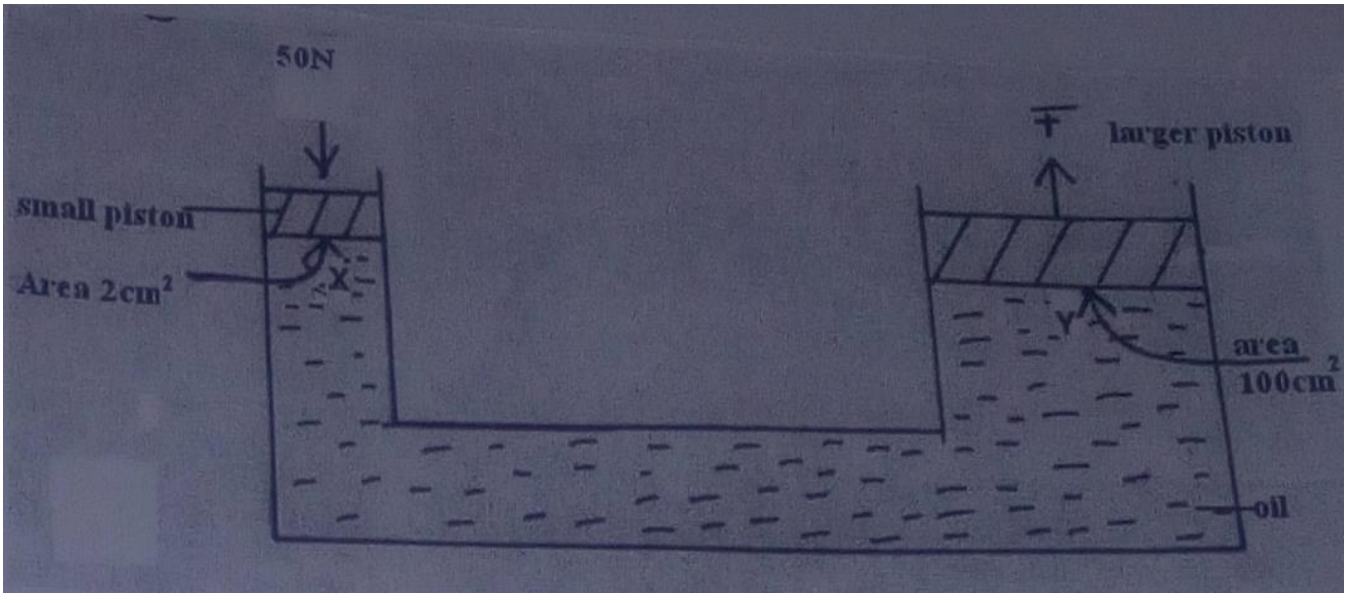
b) Explain why brakes fail in hydraulic braking system when air gets into the system. **(1mk)**

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c) The diagram below shows the principles of the hydraulic car jack



i. If a force of 50N is applied to the smaller piston; calculate the pressure produced in the oil at X **(2mks)**

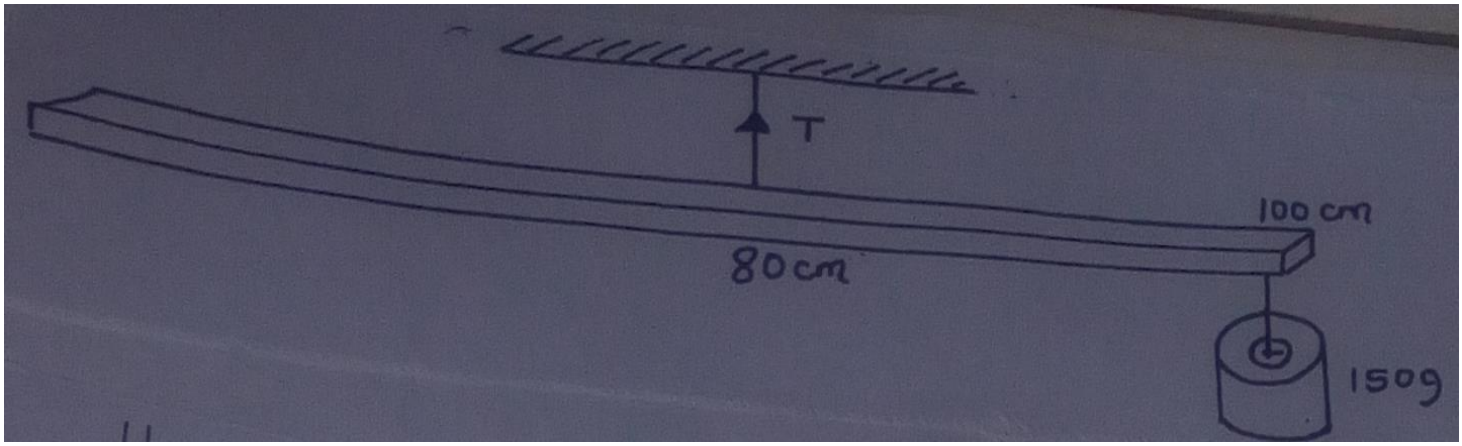
ii. Determine the force produced at larger piston Y **(2mks)**

30. a) State the principle of moments **(1mk)**

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b) A uniform metre rule of uniform width 2.5cm and thickness 0.5cm. Figure 10 below, is suspected at the 80cm mark and kept balanced by hanging a mass of 150g at 100cm mark.



Calculate;

i. The mass of the metre rule **(2mks)**

ii. The density of the material of the metre rule **(2mks)**

c) Explain why it is easier to loosen a nut using a spanner that has a longer arm than a shorter arm **(2mks)**

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d) On what principle does a bottle opener work on? **(1mk)**

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31. a) State the basic law of magnetism **(1mk)**

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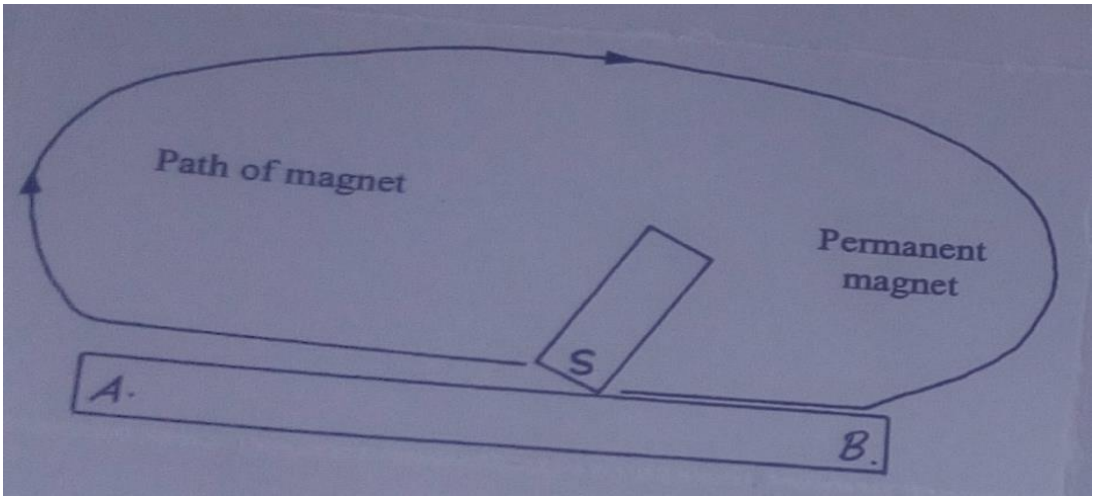
b) Explain why repulsion between two ends of magnets is the only sure test of polarity. **(2mks)**

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c) Figure 11 below shows a method of magnetization



Ferromagnetic material is being magnetized, what pole is acquired by the pole at B? **(1mk)**

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d)You are provided with two iron bars X and Y one is magnetized and the other is not. Explain how you would identify the magnetized bar. **(2mks)**

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32. i) Other than local action, state another defect of a simple cell and explain how it reduces the current product. **(2mks)**

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ii) Explain why light in a classroom are wired in parallel and not in series? **(2mks)**

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iii) State the purpose of Manganese (IV) oxide in a dry cell **(1mk)**

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iv)A current of 0.5A flows in a circuit. Determine the quantity of charge that crosses a point in 2 minutes **(3mks)**

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FORM 2 EXAMINATION TRIALS

PHYSICS

PRACTICE TEST 3

TIME: 2 HOURS

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Answer All the questions in the spaces provided

a) (a) State and explain any 3 branches of physics. **(3 marks)**

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(b) While stating an example in each case, differentiate between a derived quantity and basic physical quantity. **(4 marks)**

(c)A sphere of diameter 6.0cm is moulded into a thin uniform wire of diameter 0.2mm.Calculate the length of the wire in metres . (Take π=22/7) **(4 marks)**

b) (a)State and explain two factors affecting surface tension. **(4 marks)**

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(b) Explain three differences between mass and weight. **(3 marks)**

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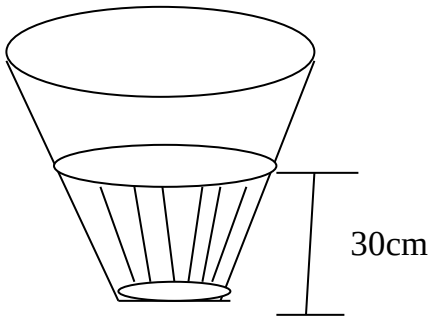
3. (a)A brick 20cm long, 10cm wide and 5cm thick has a mass 500g.Determine

(i) Greatest pressure that can be exerted by the brick. **(2 marks)**

(ii) Least pressure that can be exerted by the brick. **(2 marks)**

(b) Explain two properties of a brake fluid. **(2 marks)**

(c)The figure below shows a liquid in a pail if the liquid has a density of 1.20g/cm^3.determine the pressure exerted at the bottom of the container by the liquid. **(3 marks)**

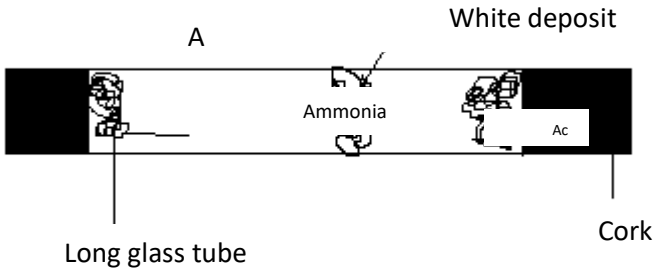


4. (a) Differentiate between the Brownian motion and kinetic theory of matter. **(1 mark)**

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(b) In the figure below, ammonia gas and an acid gas diffuse to form a white deposit on the walls of the glass tube. The deposit forms nearer end B.



State which gas diffused faster. **(1 mark)**

Explain why the gas in (a) above diffused faster. **(2 marks)**

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5. (a) Draw , show and explain features of a common thermometer. **(5 marks)**

(b) State 3 factors affecting thermal conductivity. **(3 marks)**

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6. (a) State the laws of reflection. **(2 marks)**

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b) State two application of electrostatics. **(2 marks)**

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List 3 advantages of alkaline accumulators over lead –acid accumulators. **(3 marks)**

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A battery arculated charge round a circuit for 1.5 minutes. If the current is held at 25 A ,what quantity of charge passes through the wire. **(3 marks)**

7. (a) Explain the meaning of the following: **(2 marks)**

(i) Magnetic field-

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(ii) Magnetic lines of force-

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(b) Describe three methods of demagnetizing a permanent magnet . **(3 marks)**

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(c) Use the domain theory to explain the difference between magnetic and non-magnetic material. **(2 marks)**

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8. (a) Write the following to 2 significant figures.

7321769

0.0008996

(b) If an oil drop of diameter 0.5mm spreads on the surface of water to form an oil patch of diameter 0.2m.Estimate the thickness of the oil molecule. Write your answer to 3 significant figures. **(4 marks)**

9. (a) Define moment and state its SI unit. **(2 marks)**

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(b)A uniform metre rule pivoted at its centre is balanced by a force 4.8 N at 20cm mark and some other two forces F and 2.0N at the 66cm and 90cm marks respectively. Calculate **F(3 marks)**

10. (a) Explain the meaning of "center of gravity" **(1 mark)**

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(b) Using diagrams explain the three states of equilibrium. **(3 marks)**

FORM 2 EXAMINATION TRIALS

PHYSICS

PRACTICE TEST 4

TIME: 2 HOURS

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SECTION A (25MARKS)

Answer all question this section

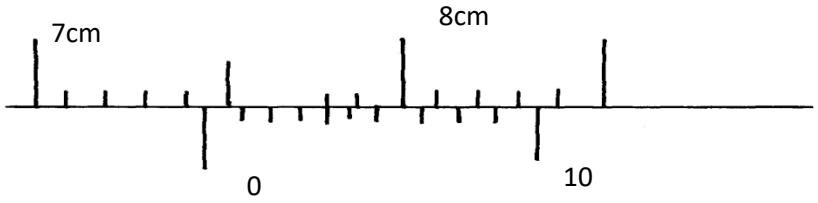
1. Distinguish between mass and weight of a body stating the S.I units for each. **(2mks)**

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2. The figure below shows part of scale of vernier calipers.



What is the reading indicated on the scale …….. **(1mk)**

3. $180cm^3$ of fresh water of density $100kg/m^3$ is mixed with $2200cm^3$ of sea water of density $1025kg/m^3$. Calculate the density of the mixture **(4mks)**

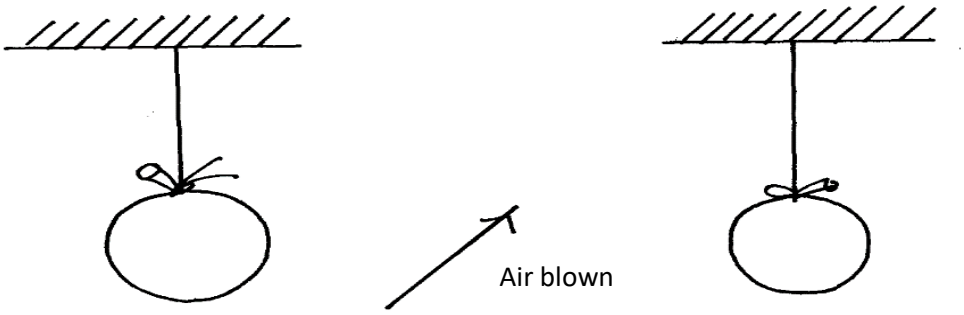
4. Explain why fish can survive under water when the surface is already frozen **(2mks)**

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5. Two inflated balloons are at the same level while suspended from threads a short distance apart as shown below;



Some air is blown gently in the space between the balloon in horizontal direction. Explain what happens to the balloons. **(2mks)**

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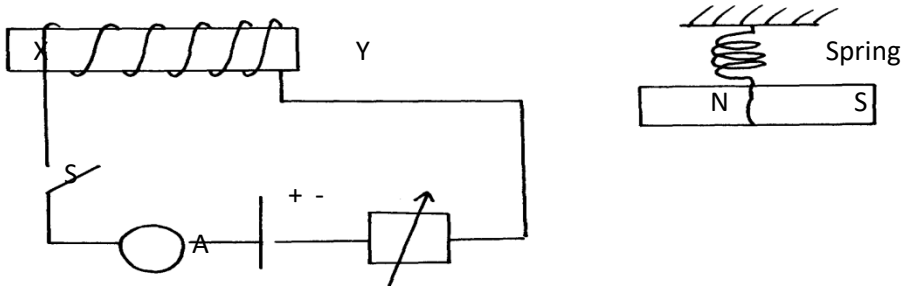
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6. State **one** advantage of an alkaline battery over a lead acid battery. **(1mk)**

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7. The diagram below shows a permanent magnet suspended by a spring. State with reason the behaviour of the magnet when the switch is closed. **(2mks)**



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8. Convection and diffusion both involve motion of fluids. Distinguish between the two. **(2mks)**

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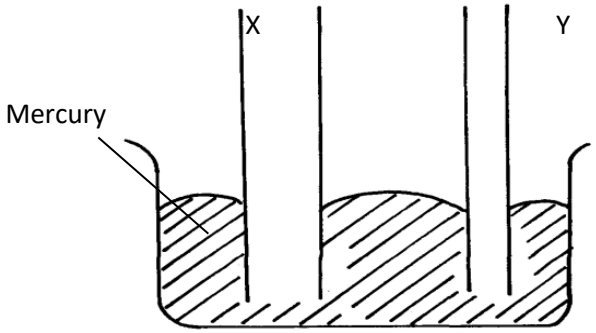
A negatively, charged rod is brought close to (but not touching) an uncharged sphere. If the sphere is momentarily earthed and then the rod is removed, briefly explain what **happens.** **(2mks)**

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9. Indicate on the diagram below, the level of mercury in the tubes **X** and **Y** **(2mks)**



10. An object weighs 1200N on a certain planet. What is the gravitational field strength of this planet if the object is 60kg? **(3mks)**

11. State **two** properties of a thermometric liquid. **(2mks)**

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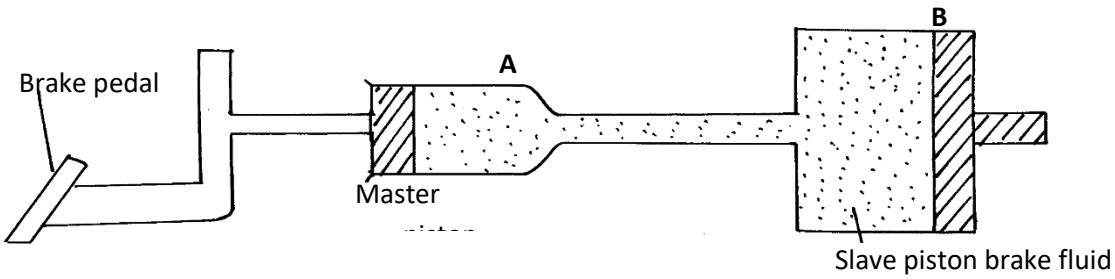
SECTION B (55MARKS)

12. Define **pressure** and give its S.I nits. **(2mks)**

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a) The diagram below represents a motor car hydraulic braking system;



State **two** properties of the liquid used as a brake fluid **(2mks)**

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Given that in the diagram **(b)** above the master piston has an area of $15cm^2$ and the slave piston has an area of $50cm^2$ a force of 100N is applied on the master piston. Find the force used to stop the car. **(3mks)**

b) Compare the values of pressure in the two pistons above and give a reason for your answer **(2mks)**

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c) Give a reason why gas is not suitable for use in place of the brake fluid. **(1mk)**

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……

d) Xcm^3 of substance A which has density of 800kg/m^3 is mixed with 100cm^3 of water with a density of 1000kg/m^3. The density of the mixture is 960kg/m^3. Determine the value of X **(3mks)**

13.

a) Give reasons why it is necessary to leave the caps of the cells open when charging an accumulator **(1mk)**

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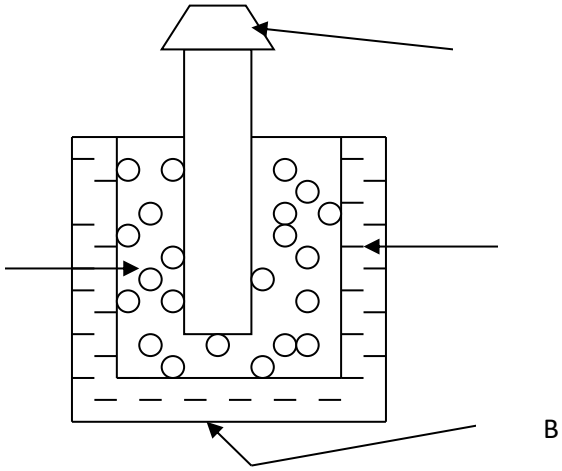
b) Define current and state its SI unit **(2mks)**

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c) A charge of 120 coulombs flow through a 1 am every minute. Calculate the current flowing through the lamp. **(3mks)**

d) What do you understand by open and closed circuits. **(2mks)**



c) State the polarities of A and B. **(2 mks)**

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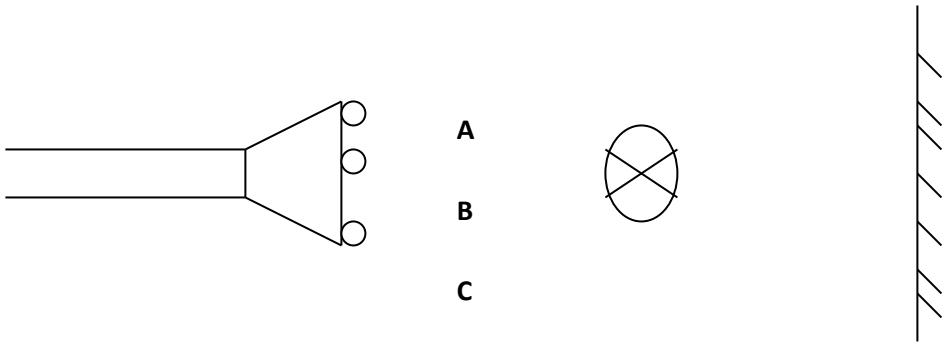
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d) Name the chemical substances in the parts labeled C and D **(2mks)**

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14. The figure shows an arrangement of source of light, an opaque object and a screen. Using A, B and C as point sources, sketch on the same diagram labeled a ray diagram to show what is observed on the screen. **(3mks)**



In a certain pinhole camera, the screen is 10cm from the pinhole. When the pinhole is placed 6cm away from a tree, a sharp image of a tree 16cm high is formed on the screen. Find the height of the tree. **(3mks)**

iii. Distinguish between Lunar and Solar eclipse by stating the events that lead to the formation of each **(4mks)**

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iv. A girl stands 4 m in front of a plane mirror

c) What is the distance between the girl and the mirror **(3mks)**

d) Explain how you would use an electroscope to distinguish between a conductor and an insulator **(3mks)**

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15.

a) Fill in the table of charges appropriately **(5mks)**

Charge on Electroscope	Charge brought near cap	Effects on leaf divergence
+ -	+ -	
+ or -	Uncharged body	

b) What is the name given to the method of charging an electroscope where it requires an opposite charge to the one of the charging materials? **(1mk)**

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c) Distinguish between a basic physical quantity and a derived physical quantity giving an example of each. **(3mks)**

Physical quantity	Derived physical quantity

d) State any **two** ways by which frictional force between two surfaces can be reduced. **(1mk)**

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e) Explain why large mercury drops form oral ball on a glass slide **(2mks)**

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Explain why a man using a parachute falls through air slowly while a stone falls through air very fast. **(2mks)**

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FORM 2 EXAMINATION TRIALS

PHYSICS

PRACTICE TEST 5

TIME: 2 HOURS

NAME…….. ADM NO…….....

SIGN……..……. DATE;……...

Answer All the questions in the spaces provided

1) Explain the following: **(2mks)**

Wet floors and wet roads are dangerous to walk on.

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Racing cyclist usually wears smooth tight clothes.

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2) Convert each of the following from Kelvin to ^{o}C. **(2mks)**

0 K

167 K.

3) A mixture consists of $40cm^3$ of water and $60cm^3$ of liquid x. If the densities of water and liquid x are $1.0g/cm^3$ and $0.8g/cm^3$ respectively. Calculate the density of the mixture. **(3mks)**

4) The air pressure at the base of a mountain is 75.0cm of mercury while at the top 60.0cm of mercury. Given that the average density of air is 1.25kg/cm^3 and the density 13600kg/m^3, calculate the height of the mountain**.** **(4mks)**

5) (a) Define the term Brownian motion and its cause. **(2mks)**

(b) Differentiate the three states of matter with relation to intermolecular space and intermolecular force. **(3mks)**

6) (a) Define the term temperature and state its SI unit. **(2mks)**

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(b) Explain why in construction, concrete beams are reinforced with steel. **(2mks)**

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(c) Explain three effects of anomalous expansion of water. **(3mks)**

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7) State three advantages of mercury over alcohol as thermometric liquid. **(3mks)**

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8) (a) State the three modes of heat transfer. **(3mks)**

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(b) State three factors affecting thermal conductivity. **(3mks)**

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(c) Explain why the ventilators for a room are put near the roof and not near the floor. **(2mks)**

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9) State the laws of reflection. **(2mks)**

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10) Explain two dangers of electrostatics. **(2mks)**

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11) State two applications of electrostatics. **(2mks)**

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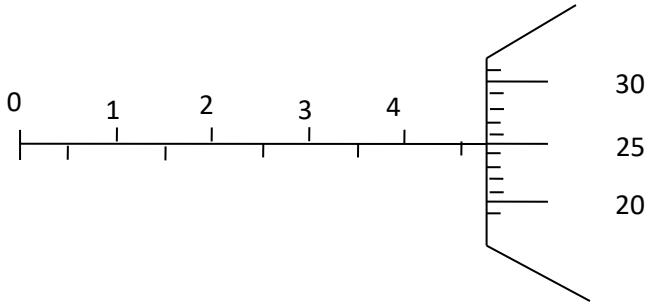
12) List three methods of demagnetizing a permanent magnet. **(3mks)**

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13) What is the reading indicated by the micrometer screw gauge below. **(3mks)**



14) A uniform metal rod of length 80cm and mass 3.2kg is supported horizontally by the two vertical spring balances C and D. Balance C is 20cm from one end while balance D is 30cm from the other end. Find the reading on each balance. **(3mks)**

15) A convex mirror of focal length 9cm produces an image on its axis 6cm from the mirror. Determine the position of the object. **(3mks)**

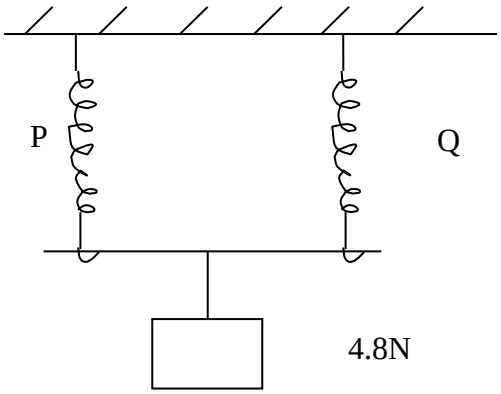
16) Explain how an electric bell works. **(3mks)**

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17) Two very light identical springs P and Q are arranged as shown below.



A weight of 4.8N is supported by the spring. Given that each spring has a spring constant of 10N/cm; determine the total extension of springs P and Q. **(3mks)**

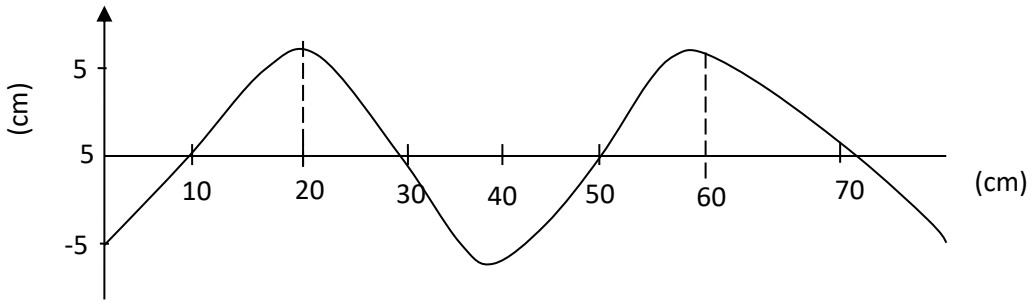
18) Differentiate between transverse waves and longitudinal waves. **(2mks)**

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19) The figure below shows a wave form in a string.



Given that the speed of the wave is 10m/s. With reference to this wave motion, determine;

a) Wavelength. **(1mk)**

b) Amplitude. **(1mk)**

c) Frequency. **(2mks)**

d) Period **(2mks)**

20) What is the relationship connecting frequency, wavelength and velocity of sound in air? **(1mk)**

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21) A person standing 49.5m from the foot of a cliff claps his hands and hears an echo 0.3 seconds later. Calculate the velocity of the sound in air. **(3mks)**

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FORM 2 EXAMINATION TRIALS

PHYSICS

PRACTICE TEST 6

TIME: 2 HOURS

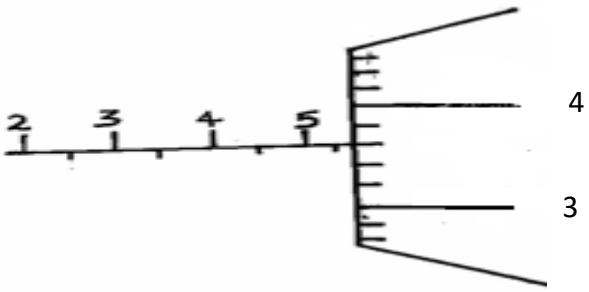
NAME…….. ADM NO…….....

SIGN……..……. DATE;……...

*Answer **ALL** questions this section in the spaces provided.*

SECTION A : (30 MARKS)

1. Figure 1 shows a micrometer with a negative error of 0.02mm used to measure the diameter of a ball bearing.



Record the diameter of the ball. **(2mks)**

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2. An oil drop of volume 0.4mm^3 was placed on a clean water surface. It spread to form a monoatomic circular patch of area 2000mm^2. Use this data to calculate the diameter of a molecule of oil. **(3mks)**

3. A fixed mass of pure water was cooled from 20°C to O°C. Sketch a graph of density of the water against temperature. **(2mks)**

4. Two 10g masses are fixed onto two similar aluminium plates, one polished and the other painted black, using wax as shown in the figure **below**.



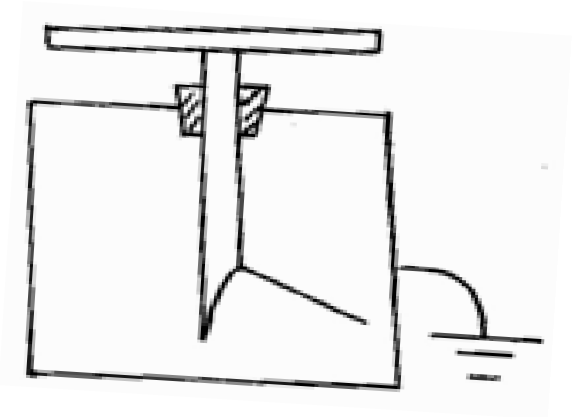
Give and explain the observation made. **(2mks)**

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5. The figure **below** shows a charged leaf electroscope.



Given a dry glass rod and silk cloth, explain how you would determine the type of charge on the electroscope. **(2mks)**

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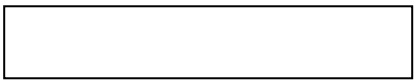
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6. State **two** advantages of alkaline accumulator over the lead-acid cell. **(2mks)**

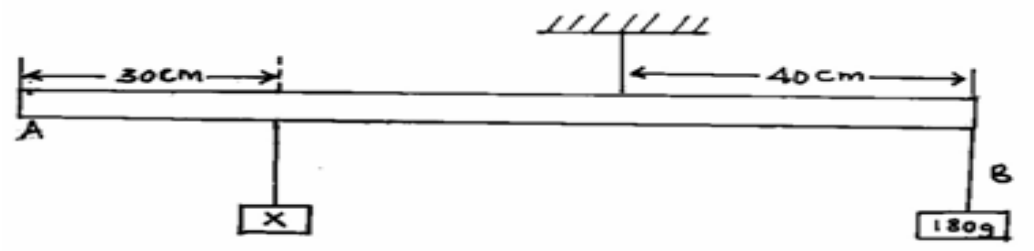
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7. The figure **below** shows two magnets whose North poles are brought close to each other. Indicate the magnetic field pattern between the two magnets. **(2mks)**



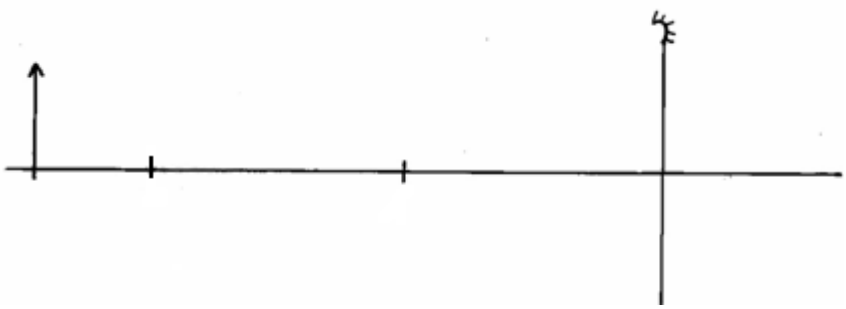
8. The diagram shows a system in equilibrium with the uniform rule supported at Q and resting horizontally.



The rule is 1m long and weighs 1.8N. Calculate the weight of the block X. **(3mks)**

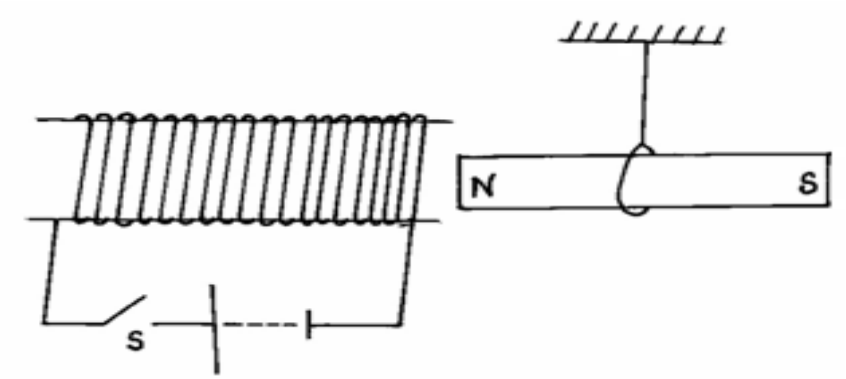
9. An object is placed infront of a concave mirror as shown in the figure **below**.

Complete the diagram to show how the image is formed. **(3mks)**

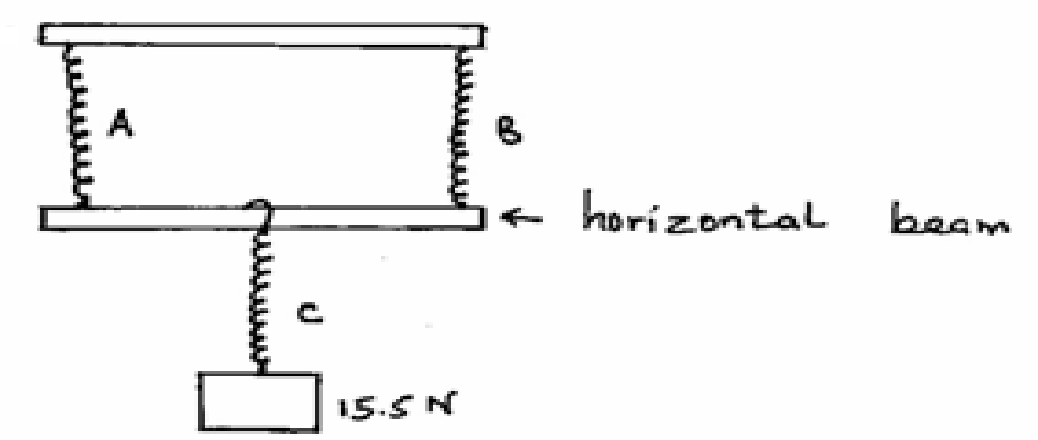


10. State and explain what will happen to the freely suspended magnet when the switch S is closed.

(2mks)



11. Three identical springs **A**, **B** and **C** are used to support a 15.5N weight as shown in the figure **below**.



If the weight of the horizontal beam is 0.5N, determine the extension of each spring given that 4N cause an extension of 1cm when using one spring. **(3mks)**

12. State **one** of the major differences between mechanical waves and electromagnetic waves. **(2mks)**

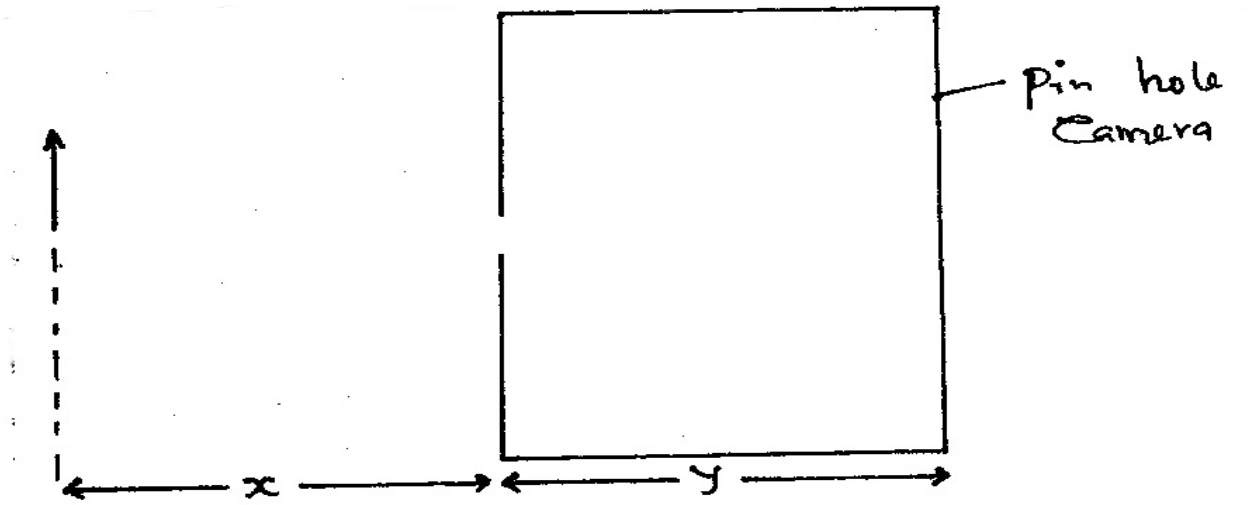
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13.A boat sent an ultrasound signal to the bottom of the sea and its echo received after 10 seconds. If the wavelength of the ultrasound in water is 0.05m and the frequency of the transmitter is 50 KHz, calculate the depth of the sea. **(3mks)**

SECTION B: (40 MARKS)

14.(a) Complete the diagram **below** to show how an image is formed in a pinhole camera. **(3mks)**



(b) State **two** characteristics of the image above. **(2mks)**

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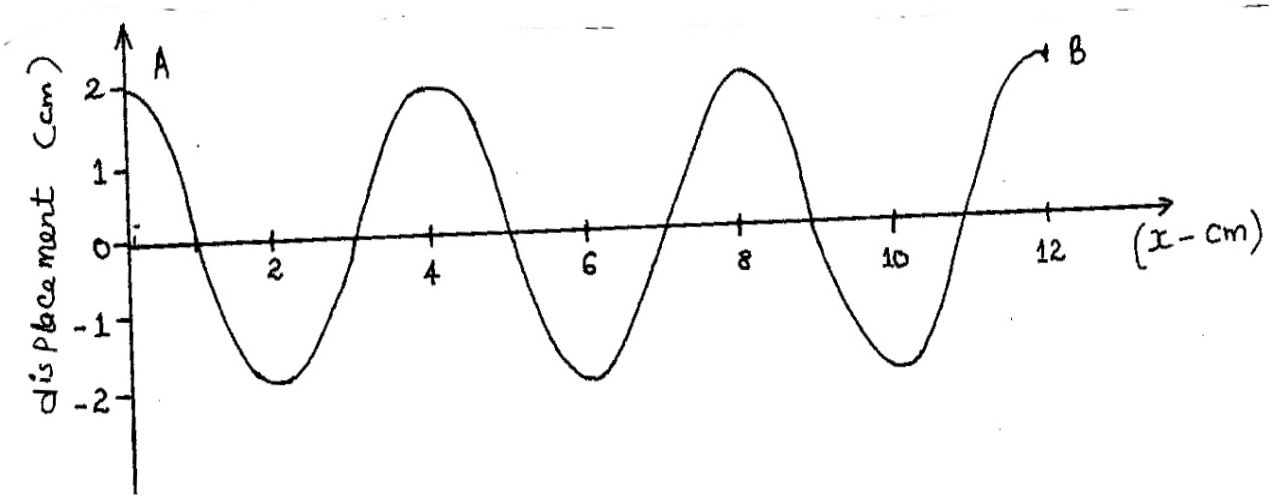
State **two** changes that will be observed about this image if the pinhole is made wider**. (2mks)**

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If χ = 30cm, y = 12cm and the heights of the image is 4cm, calculate the height of the object. **(3mks)**

15. The diagram **below** shows the wave profile of a transverse wave.



Determine

(i) the amplitude of the wave. **(1mk)**

(ii) the wavelength of the wave in metres. **(2mks)**

(iii) the period of the wave if it takes 1.5 seconds to move from **A** to **B**. **(3mks)**

Calculate:

(i) the frequency of the wave. **(2mks)**

(ii) the velocity of the wave. **(2mks)**

16. **(a)** What is diffusion? **(2mk)**

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(b) A smoke cell contain a mixture of trapped air and smoke. The cell is brightly lit and viewed through a microscope. State and explain what is observed. **(2mks)**

22) A beaker is filled completely with water. A spoonful of common salt is added slowly. The salt dissolves and the water does not overflow.

(i) State why the salt is added slowly. **(1mk)**

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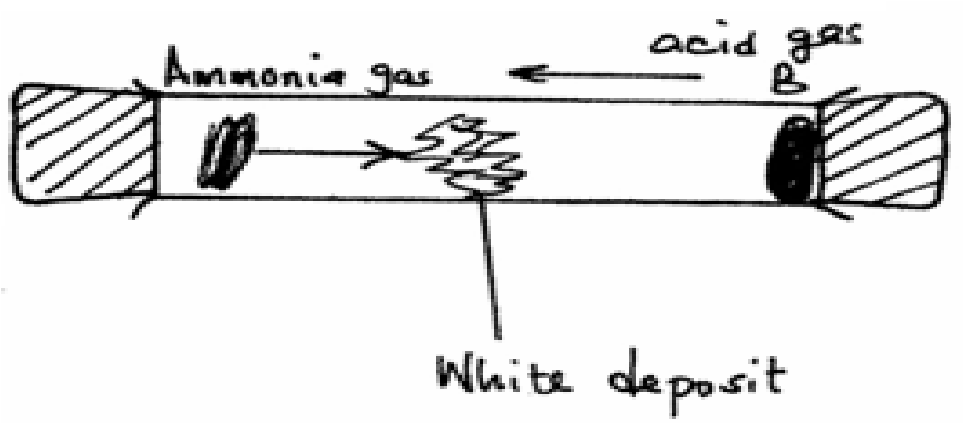
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(ii) Why doesn't the water overflow? **(1mk)**

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23) In the figure **below**, ammonia gas and acid gas diffuse and react to form a white deposit on the walls of a long glass tube as shown.



(i) What conclusion can be made from this result of this experiment? **(1mk)**

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(ii) How does the density of a gas affect the rate of diffusion? **(1mk)**

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e) The experiment is performed at a lower temperature. State and explain what would happen to the rate of diffusion of the gases. **(2mks)**

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17. (a) Give **four** differences between mass and weight. **(4mks)**

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(b) Sate Pascal's Principal. **(1mk)**

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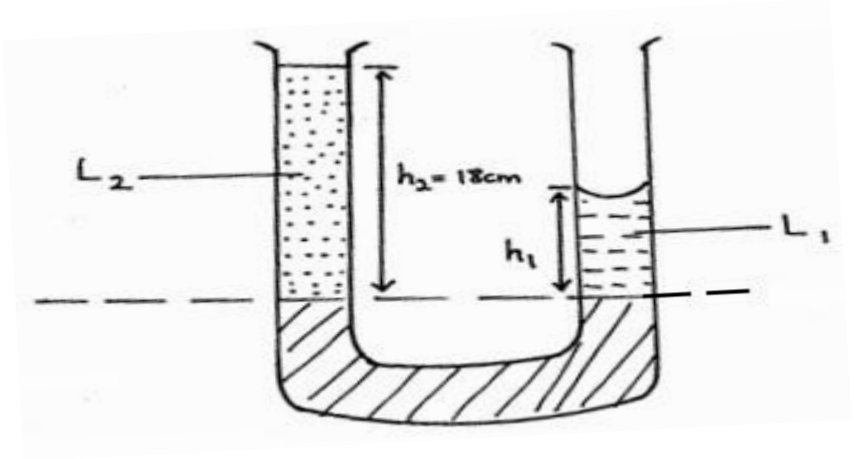
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(c) Name **two** applications of Pascal's Principle. **(2mks)**

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(d) Figure **3** shows a U-tube containing two liquids L_1 and L_2 of densities 1.6g/cm³ and 0.8g/cm³ respectively in equilibrium.



Given that $h_2 = 18cm$, determine the value of h_1. **(3mks)**

FORM 2 EXAMINATION TRIALS

PHYSICS

PRACTICE TEST 7

TIME: 2 HOURS

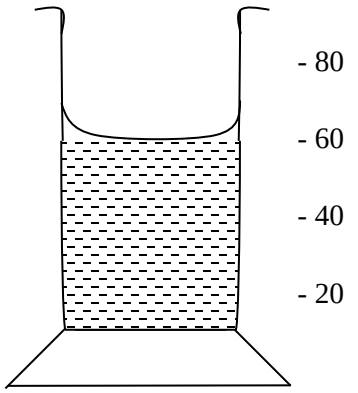
NAME…….. ADM NO…….....

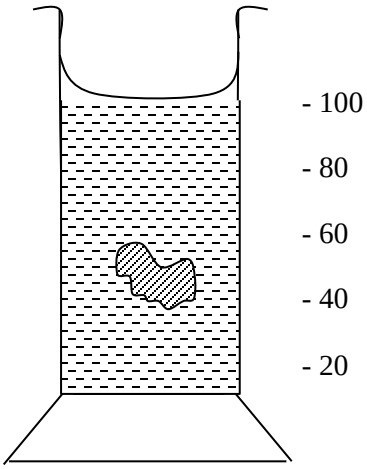
SIGN……...……. DATE;……...

SECTION A (50 MARKS)

1) Draw a Vernier caliper scale to show a reading of 3.36cm **(2 mks)**

2) The figure below shows the change in volume of water in a measuring cylinder when an irregular solid is immersed in it.





Given that the mass of the solid is 567g determine the density of the solid in Kg/m^3. (Give your answer correct to 2 d.p) **(3 mks)**

3) A small drop of oil has a volume of $5 \times 10^{-8} m^3$. When it is put on a surface of some clean water, it forms a circular film of $0.1 m^2$ in area.

i. What is the size of a molecule of oil **(3 mks)**

ii. State 2 assumptions you made in your calculations **(2 mks)**

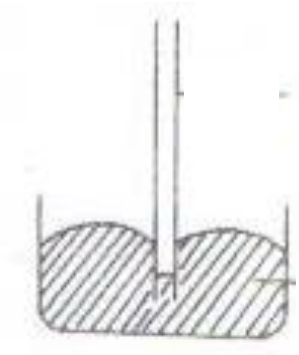
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4) A body weighs 600N on the surface of the earth and 450N on the surface of another planet. Calculate the value of g in that planet (g on the earth = 10 N/Kg) **(3 mks)**

5) The diagram below shows the behaviour of mercury in a capillary tube. Explain this observation **(3 mks)**



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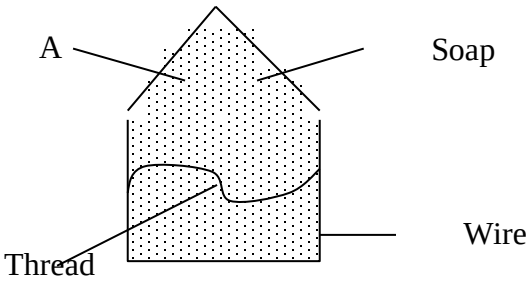
6) How does temperature rise and impurities affect the surface tension of water **(2 mks)**

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7) The diagram below shows a soap film trapped in a wire loop with a loose thread passing through



The film is then ruptured at point A

Redraw the diagram to show how the thread is affected **(2 mks)**

Explain why the thread behaves in this manner **(2 mks)**

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8) The reading on a mercury barometer at Mombasa is 760mm. calculate the pressure at Mombasa (density of mercury = 1.36×10^4 Kg/m^3) **(3 mks)**

9) Explain the reason why a person moving from lowland to highland is likely to suffer a hose bleeding **(3 mks)**

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10) Describe a simple experiment to show that pressure in liquid increases as depth increases **(3 mks)**

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11) Distinguish between the three states of matter in terms of particle spacing and kinetics **(3 mks)**

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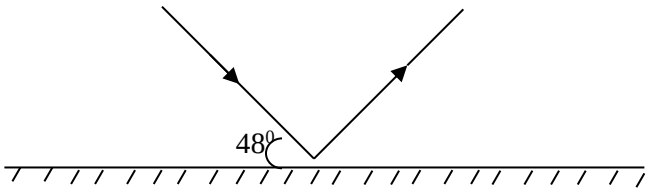
12) Explain why the blades of a panga feels colder than the wooden handle when touched with a finger after exposure to low temperatures **(2 mks)**

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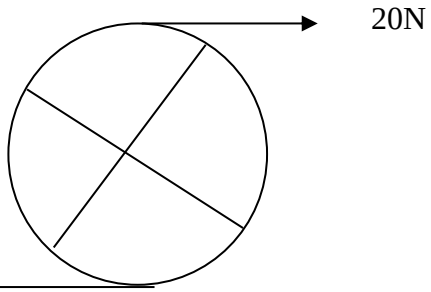
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13) The figure below shows a ray of light being incident on a mirror



What is the angle of reflection **(3 mks)**

14) The diagram below shows a "couple" in action



Given that the di[illegible]he wheel is 0.6m, determine the moment to the couple **(3 mks)**

15) State the basic law of magnetism **(2 mks)**

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16) Draw the magnetic field pattern for the magnets shown below **(2 mks)**

N	S

Explain the reason why a freely suspended bar magnet comes to rest pointing in the N – S direction **(3 mks)**

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17) Explain why repulsion is the only sure test for magnetism **(2 mks)**

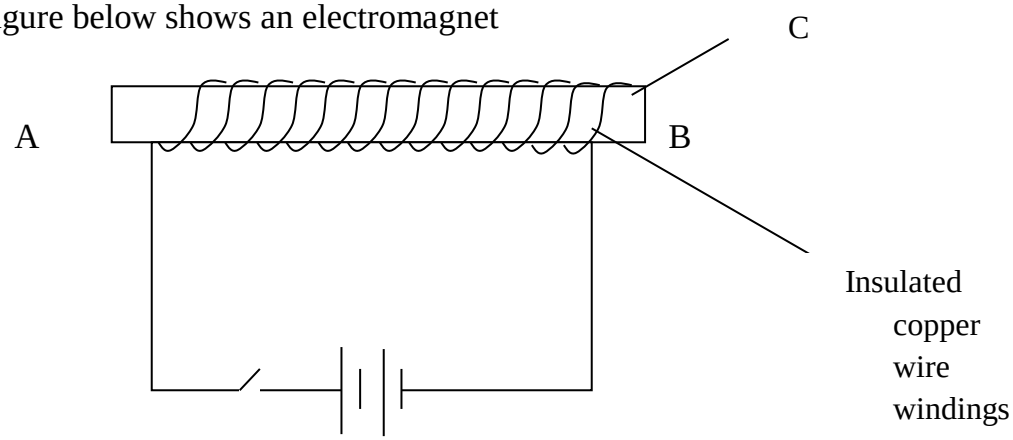
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SECTION B (50 MARKS)

18) The figure below shows an electromagnet



i. Explain why the core is made up of iron and not steel **(2 mks)**

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ii. On the same diagram indicate the direction of the current flow when the switch is closed **(1 mk)**

iii. When the current is allowed to flow through the electromagnet it is magnetized. Identify the poles of the magnet **(2 mks)**

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iv. Give the name of the law you have used to determine the poles and state it **(3 mks)**

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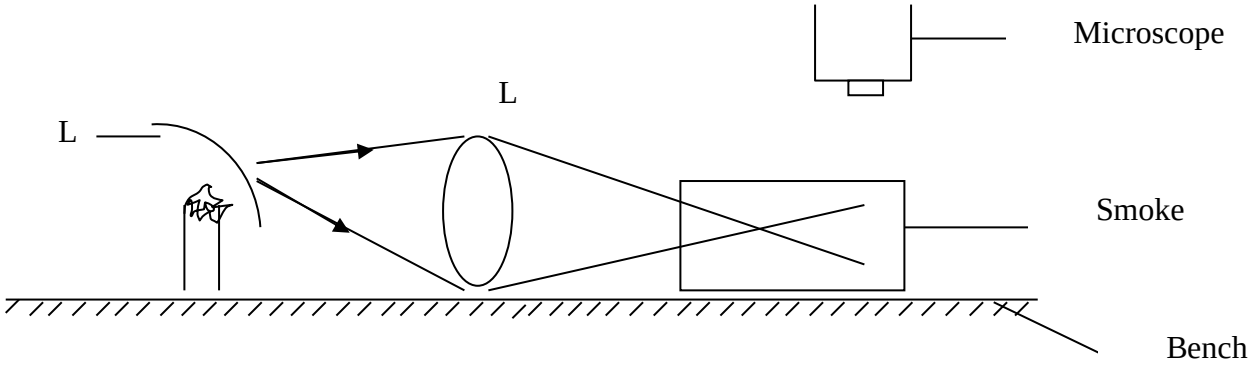
v. Explain what would happen if the current is allowed to flow for a long time **(2 mks)**

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19) Brownian motion of smoke partides can be studied by using the apparatus shown below. To observe the motion, some smoke is enclosed in the smoke cell and then observed through the microscope as shown below



a) Explain the role of the <u>smoke particles</u>, <u>lens</u> and <u>microscope</u> in the experiment **(6 mks)**

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b) State and explain the nature of the observed motion of the smoke particles **(3 mks)**

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c) State what will be observed about the motion of the smoke particles if the temperature surrounding the smoke cell is raised slightly **(1 mk)**

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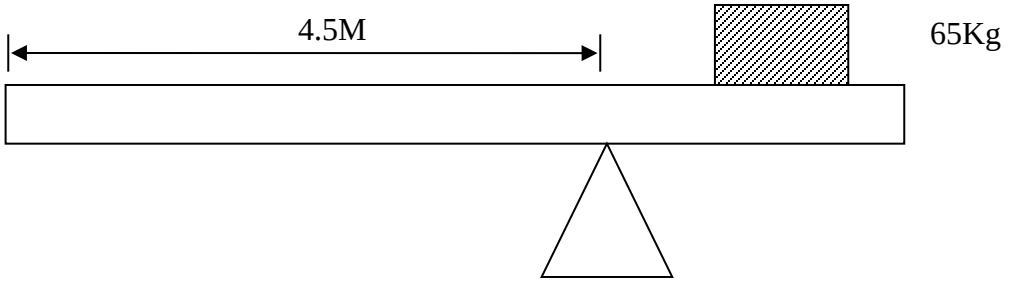
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20) a) State the principle of moments **(2 mks)**

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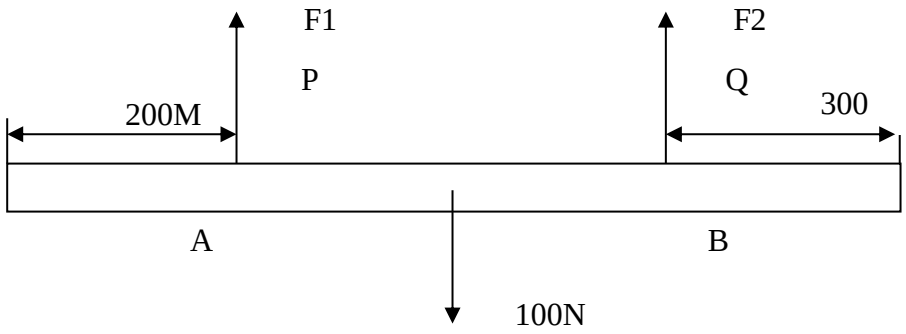
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b) The diagram below shows a uniform wooden beam of length 6m and mass 30kg pivoted as shown below



How far from the pivot will the 65kg mass be for the beam to be in equilibrium **(3 mks)**

c) A uniform metre rule of weight 100N is suspended horizontally by two vertical springs P and Q placed 20cm and 30cm from its ends respectively. Calculate the force (tension) in each string **(5 mks)**



21) In an experiment to determine the density of a soil using a density bottle, the following measurements were recorded.

Mass of empty density bottle = 42. 9g

Mass of density bottle full of water = 66.1g

Mass of density bottle with some soil = 67. 2g

Mass of density bottle with soil filled up with water = 82.0g

Use the above data to determine the:-

- Mass of water that completely filled the bottle **(2 mks)**

- Volume of water that completely filled the bottle **(1 mk)**

- Volume of the density bottle **(1 mk)**

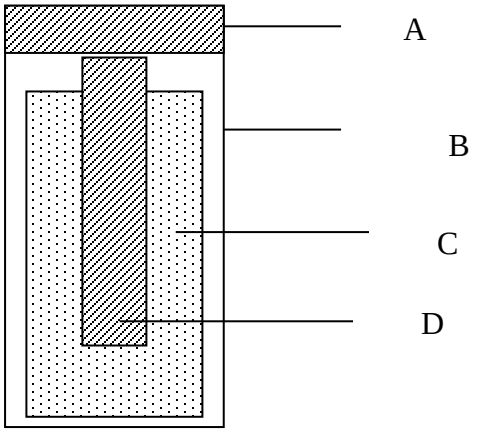
- Mass of soil **(1 mk)**

- Mass of water that filled the space above soil **(1 mk)**

- Volume of soil **(1 mk)**

- The density of the soils **(2 mks)**

22) The figure below shows the features of a dry cell (lenclanche). Use the information in the figure to answer the following questions.



i. Name the parts **(4 mks)**

A……..

B……..

C……..

D……..

ii. Explain the purpose of B **(2 mks)**

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……

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iii. State 2 defects of a dry cell and give their remedies **(4 mks)**

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FORM 2 EXAMINATION TRIALS

PHYSICS

PRACTICE TEST 8

TIME: 2 HOURS

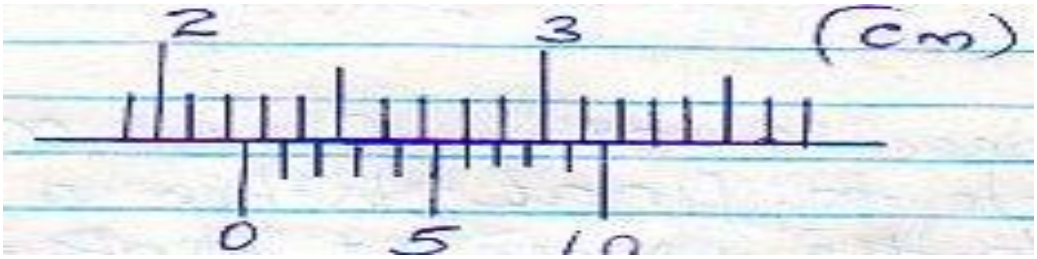
NAME…….. ADM NO…….....

SIGN……..……. DATE;……...

SECTION A (25 MARKS)

Answer all questions in the spaces provided

1. The figure below shows a scale which is part of Vernier calipers. What is the reading indicated by the scale? **(2mks)**



2. The level of liquid in a burette is 32.0cm^3. If 15 drops each of volume 0.15cm^3 are allowed to fall out of the burette, what is the new level of the liquid? **(2mks)**

3. The diagram below shows the behavior of mercury in a capillary tube. Explain this observation **(3mk)**



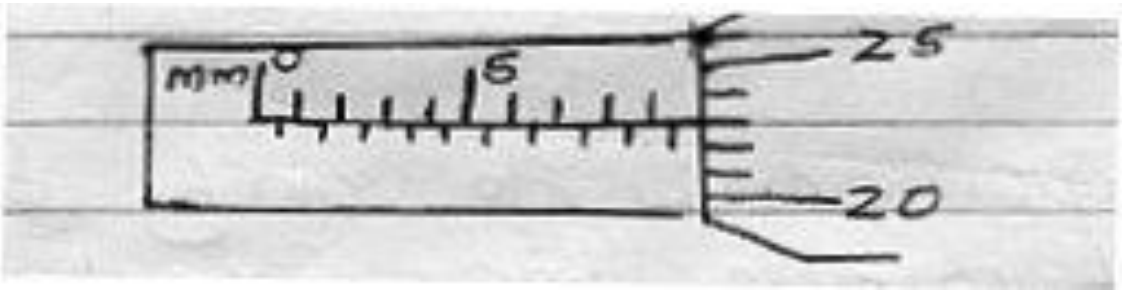
4. A body weighs 600N on the surface of the earth and 450N on the surface of another planet. Calculate the value of g in that planet (g on the earth = 10N/Kg) **(3mks)**

5. A steel needle when placed carefully on water can be made to float. When a detergent is added to the water it sinks. Explain this observation **(2mks)**

6. Distinguish between the three states of matter in terms of particle spacing and kinetics **(3mks)**

7. When marking the fixed points on a thermometer it is observed that at 0^0C, the mercury 6 thread is of length 1cm and 6cm at 100^0C. what temperature would correspond to a length of 4cm?**(3mks)**

8. The micrometer screw gauge below has a zero error of -0.19mm.



Determine the actual thickness of the object. **(2mks)**

……

……

……

9. Distinguish between hard magnetic material and a soft magnetic material **(2mks)**

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10. Describe a simple experiment to show that pressure in liquids increases with depth **(3mks)**

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SECTION B (55 MARKS)

11.(a) State Hooke's law **(1mk)**

……

……

(b) In an experiment to verify Hooke's law, a piece of rubber was fixed to a rigid support and the other end pulled with a force of ranging magnitude. The values of force and the extension were recorded as in the table below:-

Force (N)	0	0.25	0.50	0.75	1.00	1.25		
Extension(cm)	0	1.5	2.5	3.5	4.4	6.0		

Plot a graph of force (Y axis) against extension (X-axis) on he gird provided

(5mks)

From the graph, determine the spring constant of the rubber within elastic limit

(3mks)

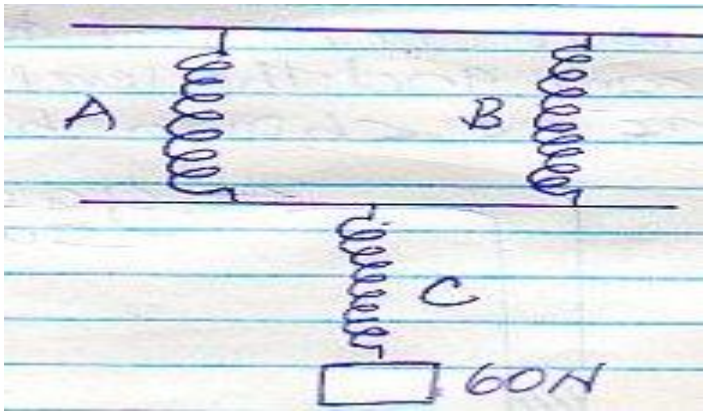
What is the size of force at the elastic limit **(2mks)**

……

……

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(c) Three identical springs A, B and C of negligible weight are connected as shown below:



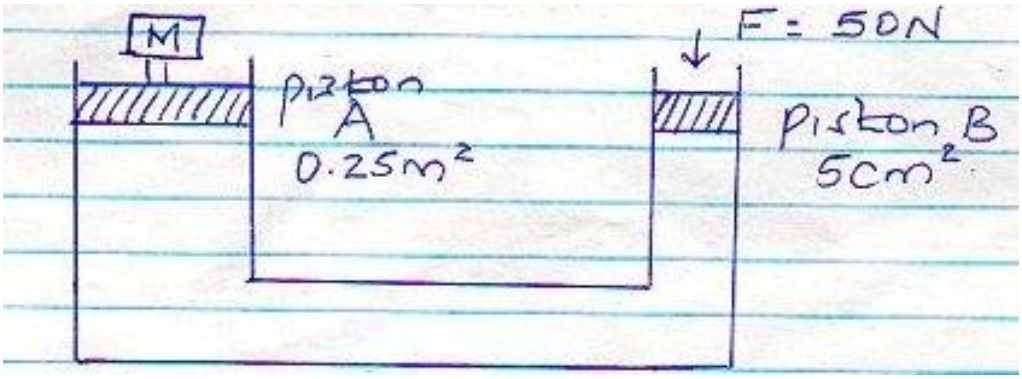
The springs support a load of 60N. if the spring constant of each is 150N/m, determine the total extension of the springs **(3mks)**

12(a) State the Pascal's principle **(1mk)**

……

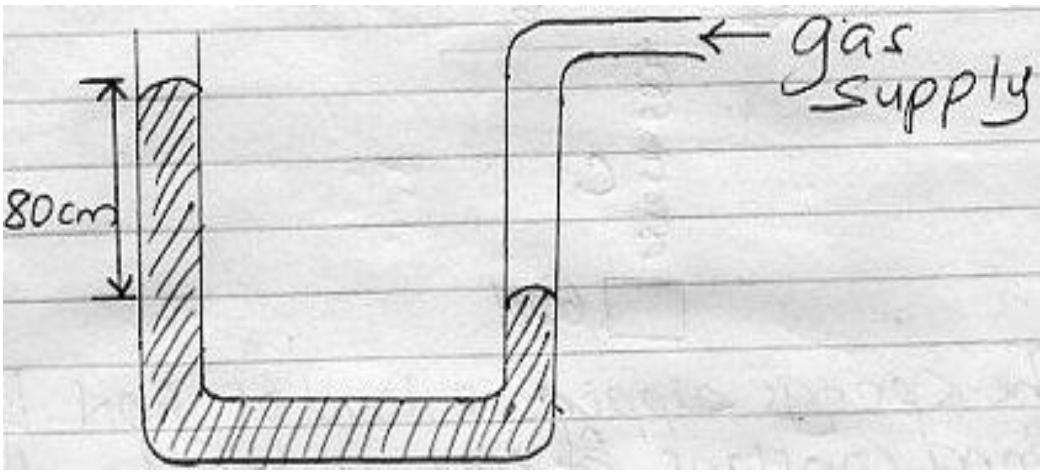
……

(b) The diagram below shows part of a hydraulic lift



Determine the value of M, the load that could be lifted using this system **(3mks)**

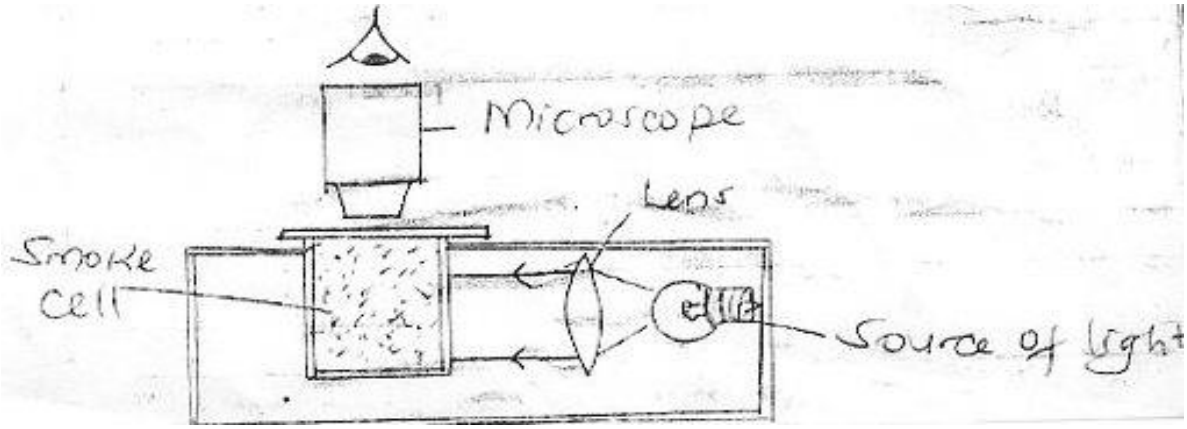
(c) A gas supply was connected to U – tube containing mercury and the level of mercury in the tube was as shown below



Given that the density of mercury is 13.6g/cm^3 and that atmospheric pressure is 1 x 105Nm-^{2}.

Determine the pressure of the gas in Nm^{-2} **(3mks)**

13.(a) The set up below is used to demonstrate Brownian motion using smoke particles



a) What is the purpose of the len? **(1mk)**

……

b) Describe the motion of the smoke particles as observed through the microscope **(1mk)**

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……

c) Explain how the motion in (b)(ii) occurs **(2mks)**

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d) What would be observed in the motion in (b) (iii) if the temperature in the smoke cell is increased **(1mk)**

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(b) In an experiment to determine the diameter of an oil molecule, an oil drop of radius 0.02cm was placed in a trag of water in which hydropodium powder had been sprinkled oil drop spread to a circular patch of radius of 0.2cm

Determine

a) The volume of the oil drop **(2mks)**

b) The area of the path **(2mks)**

c) Diameter of the oil molecule **(3mks)**

14. **(a)** What property of light is suggested by the formation of shadows? **(1mk)**

……

……

(b) A building standing 200m from a pinhole camera produces on the screen of the camera an image 2.5cm high 5.0cm behind the pinhole.

Determine the acutal height of the building **(3mks)**

(c) An object of height 2.0cm is placed 5.0cm infront of a convex mirror of focal length 10.0cm

(i) Draw to scale, a ray diagram to locate the position of the image **(3mks)**
On the grid provided.

(ii) Calculate the magnification produced by the mirror. **(3mks)**

15. **(a)** State the principle of moments **(1mk)**

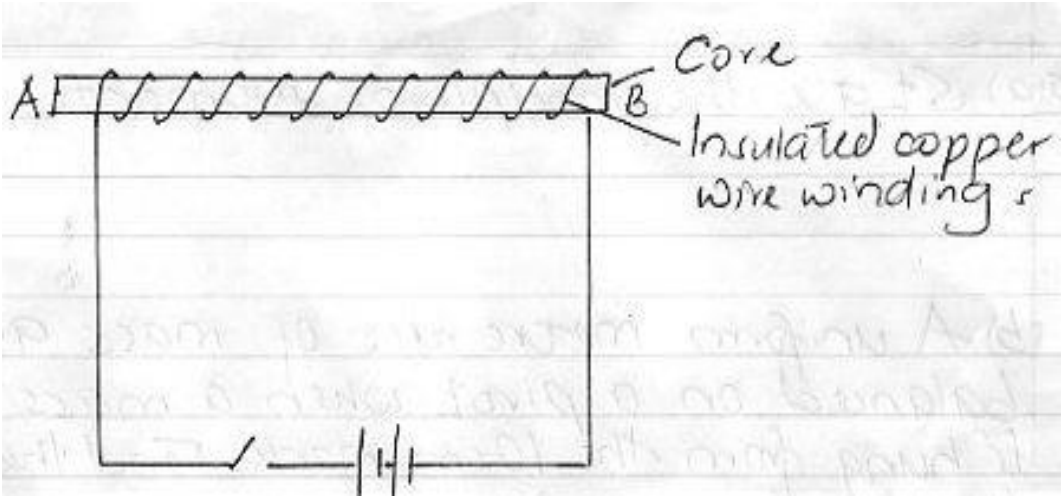
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(b) A uniform metre rule of mass 95g is balanced on a pivot when a mass of 5g is hung from the 10cm mark. Find the position of the pivot **(3mks)**

(c) A uniform metre rule pivoted at the 60cm mark is kept horizontally by placing a 50g mass on the 80cm mark. Calculate the mass of the metre rule **(3mks)**

16. The figure below shows an electromagnet



a) Explain why the cord is made up of iron and not steel **(5mks)**

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……

b) On the same diagram indicate the direction of the current flow when the switch is closed **(1mk)**

c) Whether current is allowed to flow, through the electromagnet it is magnetized.

Identify the poles of the magnet **(2mks)**

a) _____

b) _____

(iv) State three factors that affect the strength of the electromagnet **(3mks)**

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FORM 2 EXAMINATION TRIALS

PHYSICS

PRACTICE TEST 9

TIME: 2 HOURS

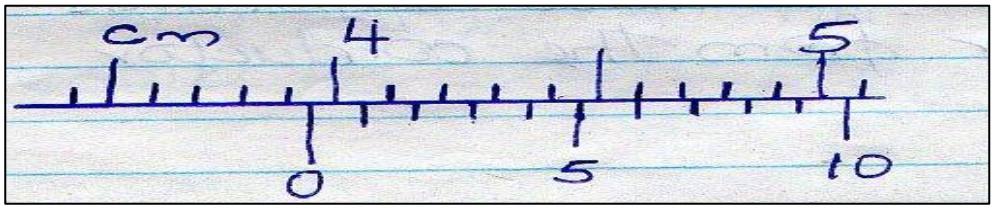
NAME…….. ADM NO…….....

SIGN……..……. DATE;……...

SECTION A (25 MARKS)

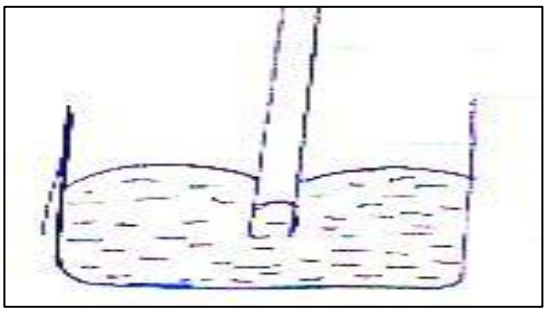
Answer all questions in the spaces provided

1) The figure below shows a scale which is part of vernier calipers. What is the reading indicated by the scale? **(2mks)**



2) Two mirrored walls stand at an angle to each other. A student standing in the room counts nine images of himself in the mirrors. Determine the angle between the walls **(3mks)**

3) The diagram below shows the behavior of mercury in a capillary tube. Explain this observation



(2mks)

……

……

4) A body weighs 600N on the surface of the earth and 450N on the surface of another planet. Calculate the value of g in that planet (g on the earth = 10N/Kg) **(3mks)**

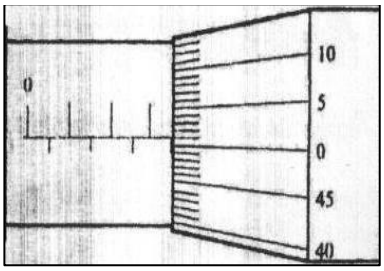
5) A steel needle when placed carefully on water can be made to float. When a detergent is added to the water it sinks. Explain this observation **(2mks)**

6) 200 coulombs of charge passes through a point in a circuit for 0.6 minutes. What is the magnitude of the current flowing? **(3mks)**

7) When marking the fixed points on a thermometer it is observed that at 0^0C, the mercury thread is of length 1cm and 6cm at 100^0C. What temperature would correspond to a length of 4cm?

(3mks)

8) The micrometer screw gauge below has a zero error of -0.19mm.



Determine the actual thickness of the object. **(2mks)**

9) Distinguish between hard magnetic material and a soft magnetic material **(2mks)**

……

……

……

10) In the smoke cell experiment, bright specks are observed to move in a continuous random manner. Explain this motion. **(2mks)**

11) State the reason why a steel sphere resting on a horizontal surface is said to be in neutral equilibrium **(1mk)**

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SECTION B (55 MARKS)

12) (a) State Hooke's law **(1mk)**

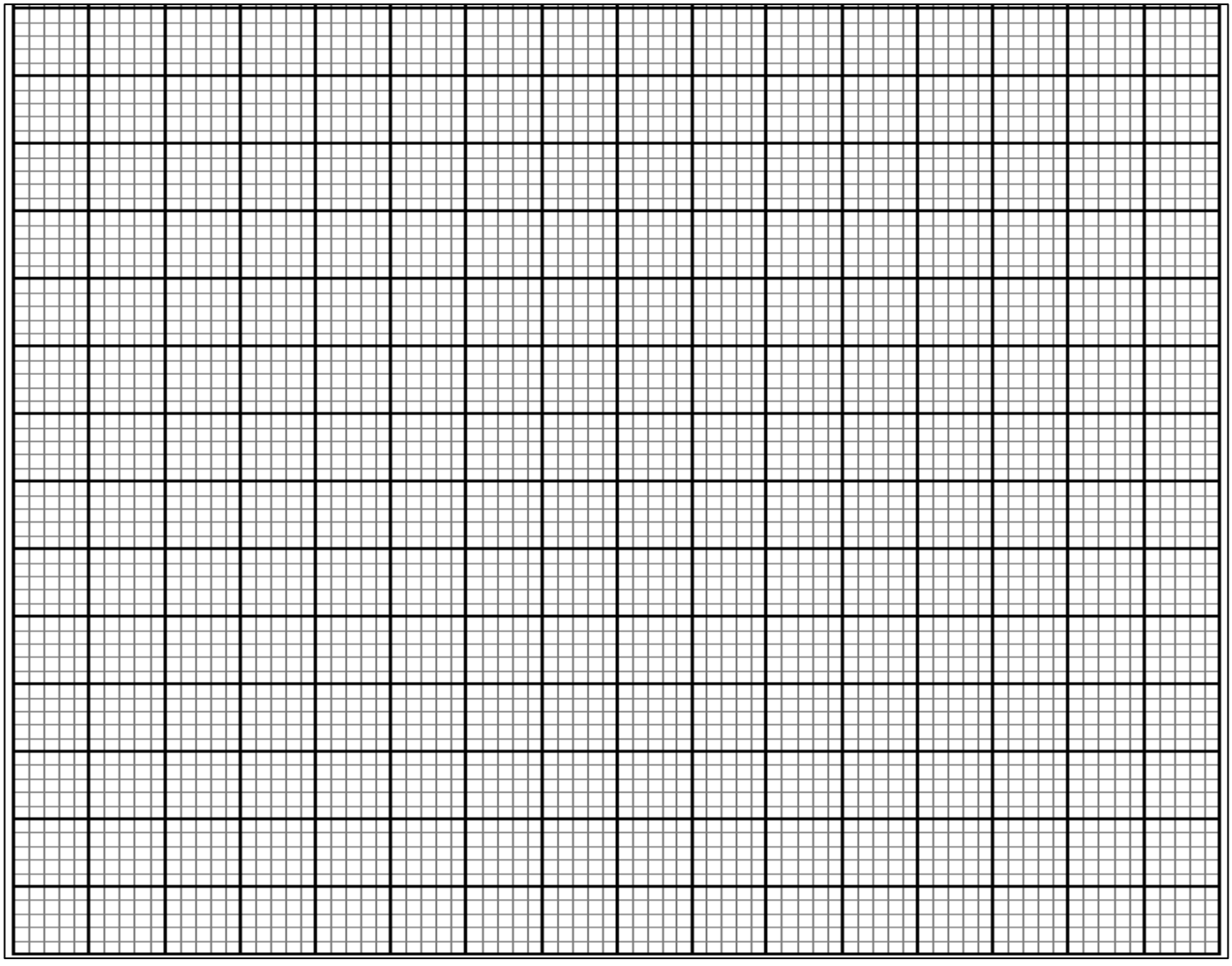
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(b) In an experiment to verify Hooke's law, a piece of rubber was fixed to a rigid support and the other end pulled with a force of ranging magnitude. The values of force and the extension were recorded as in the table below:-

Force (N)	0	0.20	0.55	0.75	1.00	1.30	1.40
Extension(cm)	0	1.5	2.5	3.5	4.5	6.0	7.0

Plot a graph of force (Y axis) against extension (X-axis) on the gird provided **(5mks)**

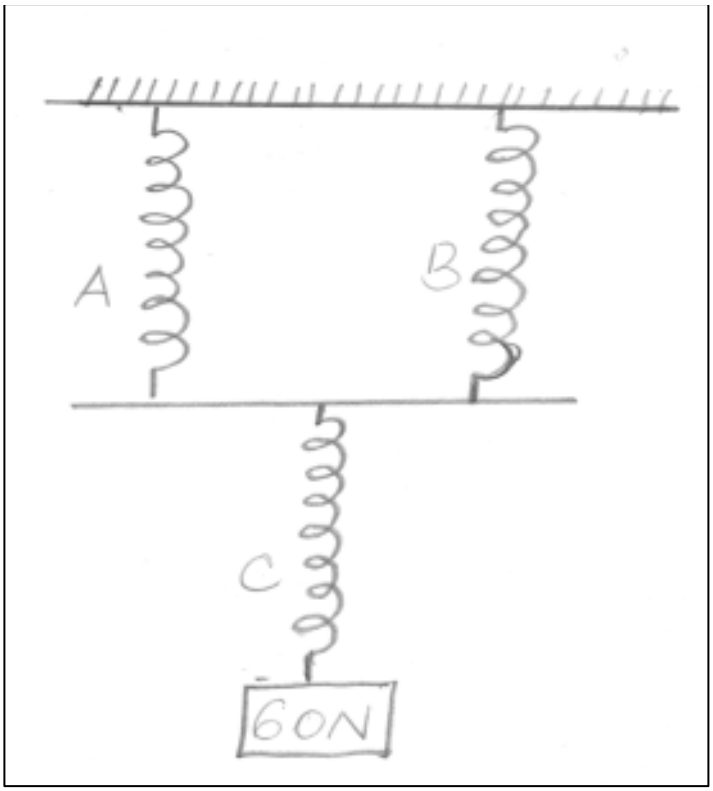


- From the graph, determine the spring constant of the rubber within elastic limit

(3mks)

- What is the size of force at the elastic limit **(2mks)**

(c) Three identical springs A, B and C of negligible weight are connected as shown below:



The springs support a load of 60N. If the spring constant of each is 150N/m, determine the total extension of the springs **(3mks)**

13) (a) State the Pascal's principle **(1mk)**

……

……

(b) The height of a mercury barometer at a particular place is 70cm. given that the density of mercury is 13600kgm^3, determine;

(i) The atmospheric pressure at the place. **(3mks)**

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(ii) The height of a water barometer at the same place. (Density of water=1g/cm^3) **(2mks)**

(iii) Give a reason why mercury is preferred as a barometric liquid. ` **(1mks)**

(c) Calculate the minimum pressure a block of dimensions 3cm*10cm*15cm and mass 12kg could exert on a horizontal surface. **(3mks)**

14) (a)In an experiment to determine the diameter of an oil molecule, an oil drop of radius 0.02cm was placed in a tray of water in which lycopodium powder had been sprinkled oil drop spread to a circular patch of radius of 0.2cm

Determine

i. The volume of the oil drop **(2mks)**

ii. The area of the patch **(2mks)**

iii. Diameter of the oil molecule **(3mks)**

(b) state two assumptions made in the experiment above. **(2mks)**

15) (a) What property of light is suggested by the formation of shadows? **(1mk)**

(b) A building standing 200m from a pinhole camera produces on the screen of the camera an image 2.5cm high 5.0cm behind the pinhole.

Determine the actual height of the building **(3mks)**

(c) An object of height 2.0cm is placed 5.0cm in front of a convex mirror of focal length 10.0cm

(i) On the grid provided,draw to scale a ray diagram to locate the position of the image.(4mks)

(ii) Calculate the magnification produced by the mirror. **(2mks)**

16) (a) State the principle of moments **(1mk)**

(b) The figure below shows a uniform metre rule of mass 300g acted upon by a number of forces.

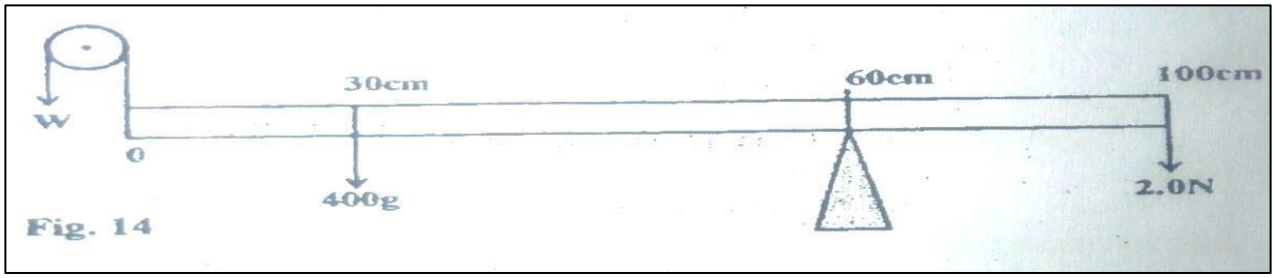


Fig. 14

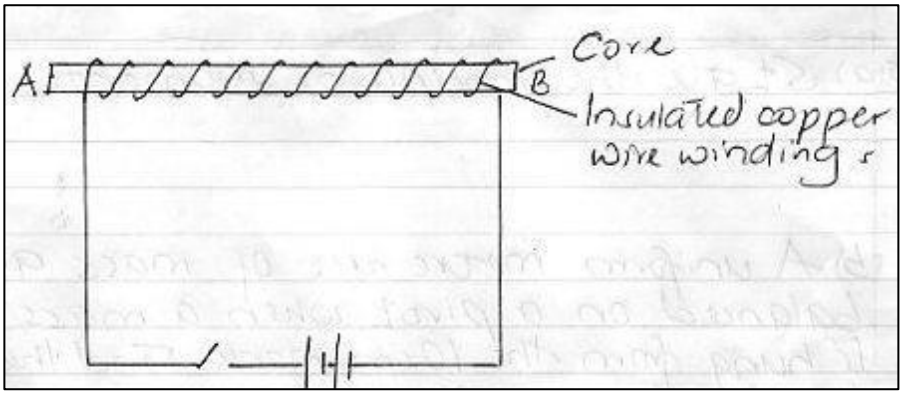
Determine;

Sum of clockwise moments(leave your answer in terms of W) **(2mks)**

Sum of anticlockwise moments **(2mks)**

The force W **(2mks)**

17) The figure below shows an electromagnet



Explain why the cord is made up of iron and not steel **(2mks)**

……

……

……

On the same diagram indicate the direction of the current flow when the switch is closed **(1mk)**

c) When current is allowed to flow, the electromagnet becomes magnetized.

Identify the poles of the magnet **(2mks)**

a) _____

b) _____

State three factors that affect the strength of the electromagnet **(3mks**

……

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FORM 2 EXAMINATION TRIALS

PHYSICS

PRACTICE TEST 10

TIME: 2 HOURS

NAME…….. ADM NO…….....

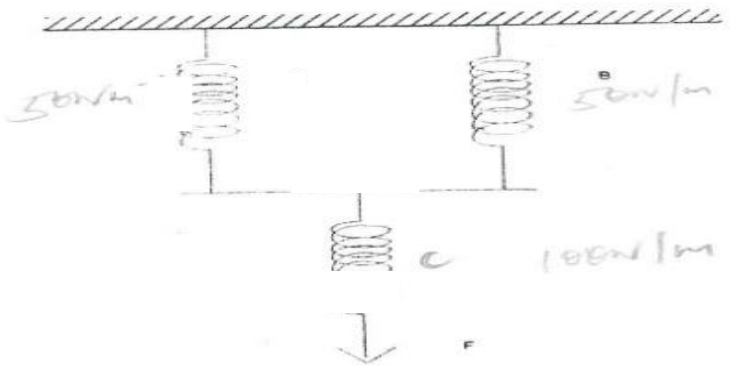
SIGN……..……. DATE;……...

Answer All the questions in the spaces provided

SECTION A (25 MARKS)

1. Study the arrangement and answer the questions that follow.

A and B are identical rubber strips and each has an elastic constant of $50Nm^{-1}$. C has an elastic constant of $100Nm^{-1}$.



If C extends by 4 cm, by how much would A extend? **(2 mks)**

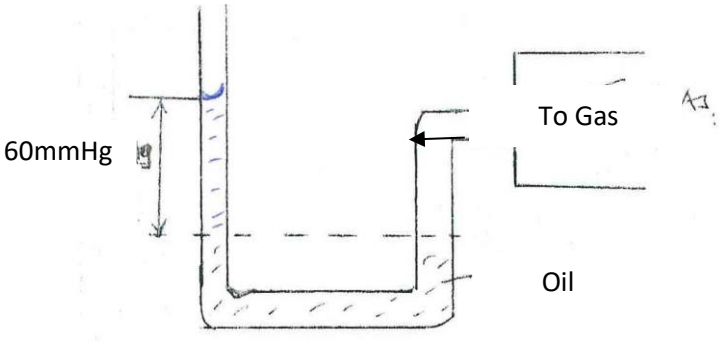
Determine the force F, which would cause these extensions. **(2 mks)**

2. State two factors that affect the turning effect of a force. **(2 mks)**

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3. The figure below shows a u-tube manometer containing oil of density $0.9g/cm^3$. One end is connected to a gas tap.



If atmospheric pressure is 1.0×10^5 pa, find the pressure of the gas. **(3 mks)**

4. State two advantages of an alkaline cell over a lead-acid cell. **(2 mks)**

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5. Three forces 12N due East, 4N due South and 15N due West acted on a body. If the body was in equilibrium, find the resultant force. **(2 mks)**

6. Explain the following observation. A balloon, when rubbed on a blazer, it sticks to the ceiling board. **(1 mk)**

7. A block measuring 20cm by 10cm by 4cm rests on a flat surface. The block has a weight of 6N. determine;

- The minimum pressure it exerts on the surface. **(2 mks)**

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- The density of the block in kg/m^3. **(3 mks)**

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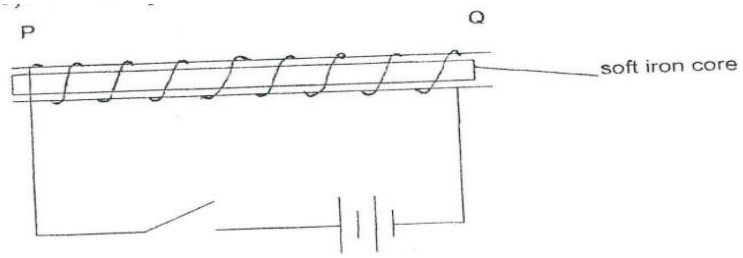
8. The figure below shows a uniform cardboard in the shape of a parallelogram.



Locate the centre of gravity of the cardboard. **(1 mk)**

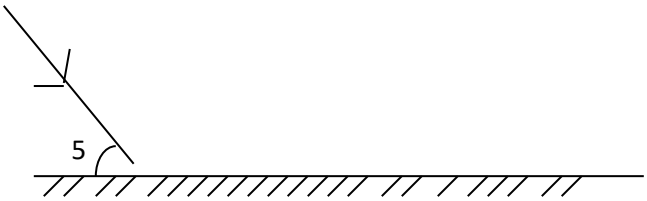
9. (a) What is an electromagnet? **(1 mk)**

(b) Name the polarity of ends P and R on the diagram below, when the current is switched on



P …… and Q …… **(1 mk)**

10. The figure 4 below shows a ray of light incident on the surface of a plane mirror.



The mirror is now rotated clockwise through an angle of 10^0. Find the angle between the incident and the reflected rays. **(1 mk)**

11. The force on a current carrying conductor in a magnetic field can be varied by changing among other, the magnetic field strength and magnitude of the current. Name two other factors that cause the force to vary. **(2 mks)**

SECTION B: (55 MARKS)

12. (a) Sketch a diagram of micrometer screw gauge with the reading of 12.25 mm. **(2 mks)**

(b) The oil level in a burette is $10.0cm^3$. 5000 drops of the oil are run off the burette. If the radius of 1 drop is 0.7 mm.

a) Calculate the volume of one drop. **(2 mks)**

b) What is the final reading of the burette. **(1 mk)**

(c) The oil was made to spread on a surface of water forming a circular patch of diameter 21.0 m.

i. Calculate the area of the oil patch. **(2 mks)**

ii. Calculate the thickness of the oil molecule. **(2 mks)**

(d) State one assumption made in c(ii) above. **(1 mk)**

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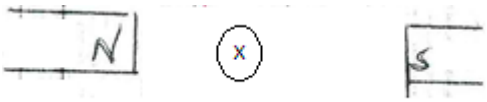
13. (a) State the Flemings left hand rule. **(1 mk)**

……

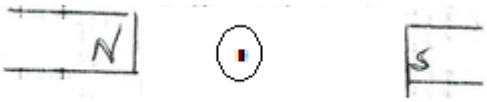
……

(b) Sketch the resultant field pattern around the following current carrying conductor and show the direction of the forces acting on the conductors.

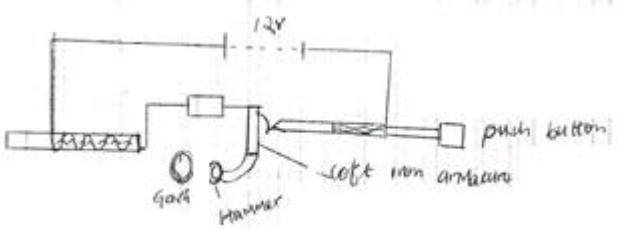
(i) Current flowing into the paper. **(1 mk)**



(ii) Current flowing out of the paper. **(1 mk)**



(c) The diagram below shows an electric bell.



(i) Describe how the electric bell works. **(4 mks)**

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(ii) Explain what would happen if the armature is made of steel. **(1 mks)**

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(iii) What adjustment should be done to the system to make it operate effectively with a lower voltage battery. **(1 mk)**

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14. (a) Differentiate between a real image and a virtual image. **(1 mk)**

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(b) An object of height 10cm is placed 5cm infront of a concave mirror of local length 10cm.

(i) By use of ray diagram shows the location of the image on the grid provided **(4 mks)**

Use the ray diagram in (i) above to determine the

(ii) Image distance **(2 mks)**

(iii) Magnification **(3 mks)**

(c) State the reason why convex mirror is used as a driving mirror instead of plane mirror**. (1 mks)**

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15. (a) State Hooke's law. **(1 mk)**

……

……

(b) A spring with the upper end fixed, hang vertically and several masses are suspended from its lower end one at a time. The readings were recorded as shown.

Mass in kg	0	0.02	0.04	0.06	0.08	0.10
Extension mm	0	11	9	29	41	51
Force N						
Extension in m						

(i) Fill in the table. **(2 mks)**

(ii) Plot a graph of extension in (m)(y-axis) against force in N. **(5 mks)**

(c) (i) From the graph determine the extension of a mass 0.045kg. Give your answer in mm**.(2 mks)**

(ii) Determine the spring constant of the spring. **(3 mks)**

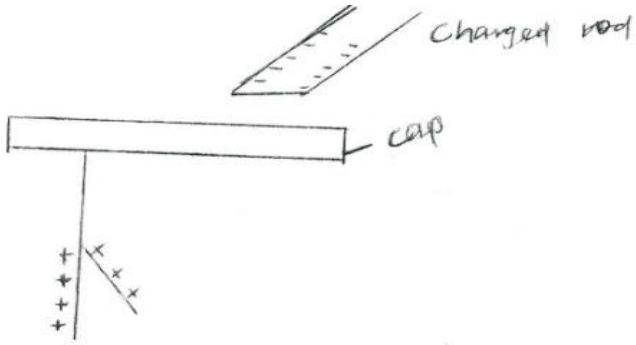
(d) If two such springs were connected in series, what extension would they show when a mass of 1.5kg hangs from one end. **(2 mks)**

16. (a) State two advantages of a lead acid accumulator over dry cells. **(2 mks)**

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(b) The figure below shows a highly negatively charged rod being brought slowly near the cap of a positively charged gold leaf electroscope.



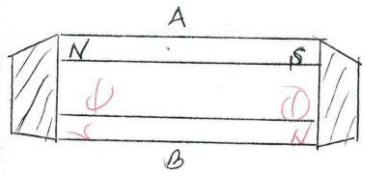
State and explain what will be observed on the leaf of the electroscope. **(2 mks)**

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(c) The figure below shows how keepers are used to store magnets. **(2 mks)**



Mark on the diagram the polarity of the magnet B. **(2 mks)**

d) Briefly explain how keepers assist in storing magnets. **(2 mks)**

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- ✓ KCSE MOCKS
- ✓ TOP SCHOOLS MOCKS
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