MAGNETISM

1. 1995 Q15 P1

Give a reason why attraction in magnesium is not regarded as a reliable method of testing for polarity. (1 mark)

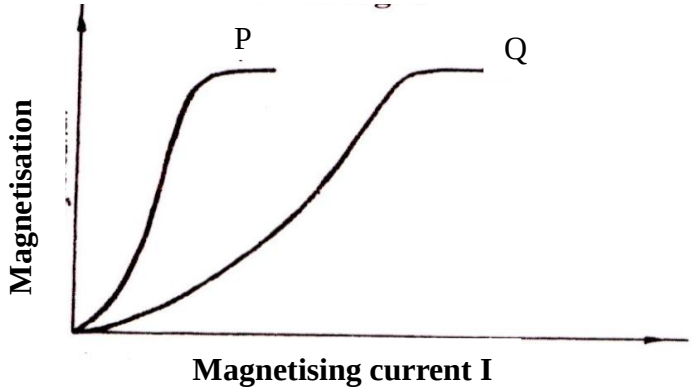
2. 1996 Q2 P2

(a) Given a bar magnet, an iron bar and a string

i) Describe a simple experiment to distinguish between the magnet and the iron bar (4 marks)

ii) State with reasons the observation that would be made in the experiment. (4 marks)

(b) In an experiment to magnetize two substances P and Q using electric current, two curves(graphs) were obtained as shown in figure 1



Using the information in Fig 1, explain the difference between the substances P and Q with references to the domain theory (6 marks)

3. 1997 Q14 P1

Distinguish between soft and hard magnetic materials (1 mark)

4. 1997 Q16 P1

Figure 7 shows an incomplete circuit of an electromagnet. Complete the circuit between X and Y drawing the windings on the two arms of the core such that A and B are both North poles when switch S is closed. Indicate the direction of the current on the windings drawn.

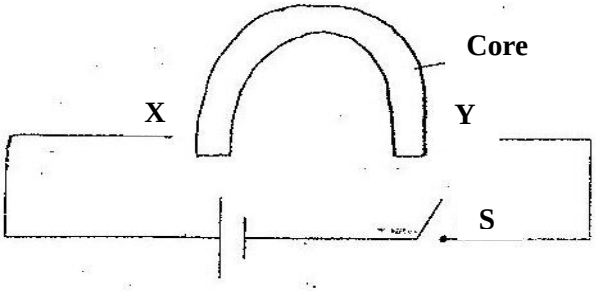


Fig 7

5. 1997 Q5a, b P2

(a) State two factors that affect the strength of an electromagnet.

(b) In the set up in figure 5, the suspended metre rule is in equilibrium balanced by the magnet and the weight shown. The iron core is fixed to the bench.

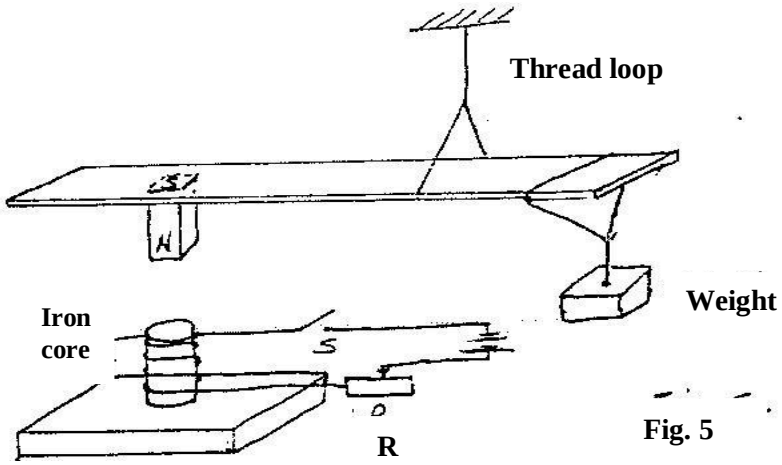


Fig. 5

(i) State and explain the effect on metre rule when the switch S is closed

(ii) What would be the effect of reversing the battery terminals

(iii) Suggest how the set up in figure 5 can be adapted to measure the current flowing in the current circuit.

6. 1998 Q14 P1

Explain how hammering demagnetizes a magnet

7. 1999 Q12 P1

How can it be shown that the strength of a magnet is concentrated at the poles?

8. 2000 Q12 P1

Fig. 7 shows how magnets are stored in pairs with keepers at the ends

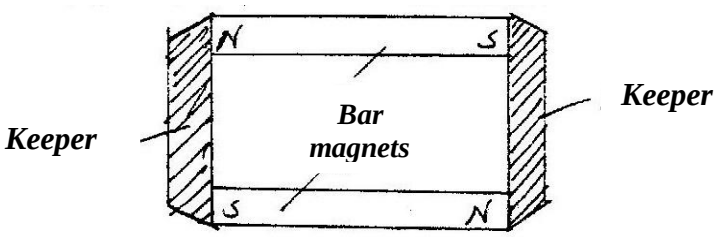


Fig. 7

Explain how this method of storing helps in retaining magnetism longer.

9. 2001 Q11 P1

Fig 8 shows a soft-iron ring placed between the poles of a magnet. On the same diagram sketch the magnetic field pattern.

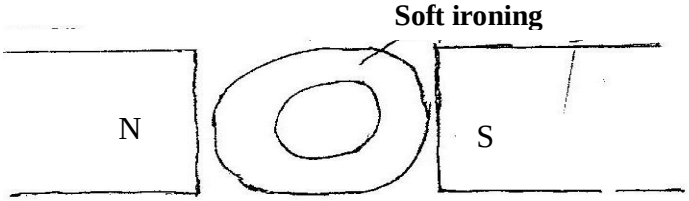
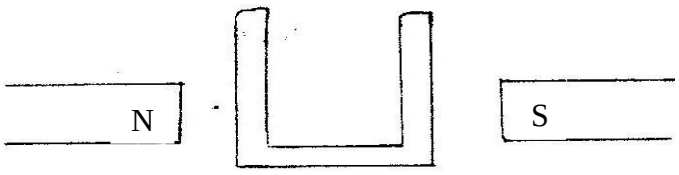


Fig. 8

10. 2002 Q11 P1

Fig. 6 shows a soft iron placed between poles of two magnets.

Figure 6



Sketch the magnetic field pattern.

11. 2003 Q12 P1

Figure 8 shows a bar of soft iron placed near a magnet.

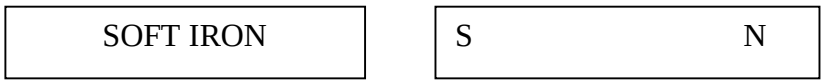


Figure 8

On the same diagram, sketch the magnetic field pattern due to the set up

12. 2003 Q13 P1

Give a reason why the core of the electromagnet of an electric bell is made of soft iron and not steel.

13. 2004 Q11 P1

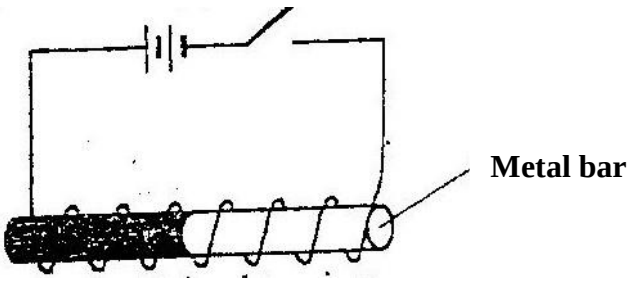
Figure 7 shows the poles of two magnets close together.

Fig 7

Sketch the magnetic field pattern in the space between the poles. (1 marks)

14. 2004 Q37P1

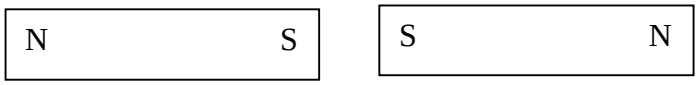
In the set up Fig 17 the metal rod is made up of steel and iron pieces joined end. Your are provided with two iron nails.



Explain how you would use two nails provided to determine
which side is iron (2marks)

15. 2006 Q1 P2

Figure 1 shows two bar magnets placed with the south poles close together



In figure 1 sketch the magnetic field pattern between the two south poles (1 mark)

16. 2007 Q3 P2

Figure 2 shows a horse –shoe magnet whose poles are labelled and two other magnets near it. Iron nails are attracted to the lower ends of the magnets as shown.

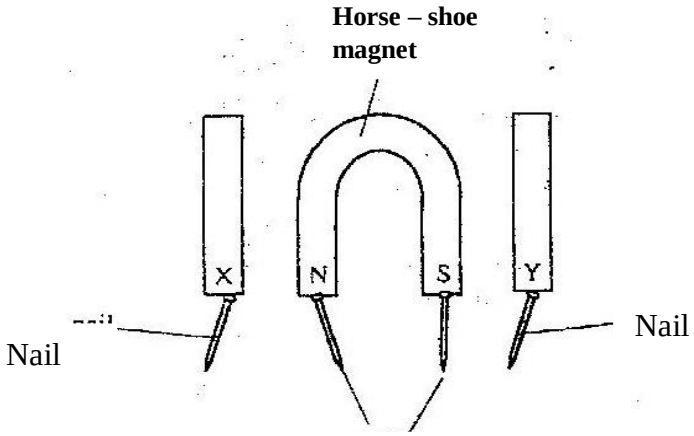


Fig 2 Nails

Identify the poles marked X and Y (1 mark)

17. 2008 Q4 P2

An un-magnetized steel rod is clamped facing North-South direction and then hammered repeatedly for some time. When tested, it is found

to be magnetized. Explain this observation. (2 marks)

18. 2010 Q2 P2

Figure 2(a), shows a magnetic compass placed under a horizontal wire XY

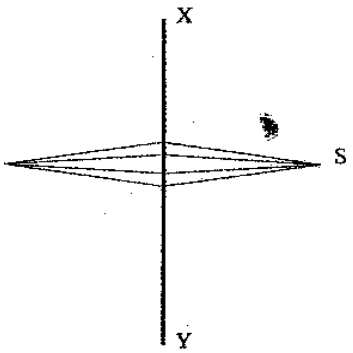


Figure 2(a)

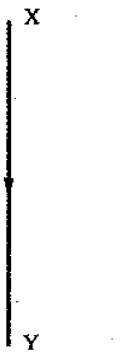


Figure 2(b)

A large current is passed from X to Y. Draw the final position of the magnetic compass needle in figure

19. 2011 Q6 P2

One method of producing a weak magnet is to hold a steel rod in the North South direction and then hammer it continuously for some time. Using the domain theory of magnetism explain how this method works.

(2 marks)

20. 2013 Q3 P2

State the reason why the magnetic field strength of a magnet is greatest at the poles. (1mark)

21. 2014 Q7 P2

Figure 4 shows the magnetic field pattern around two bar magnets placed side by side.

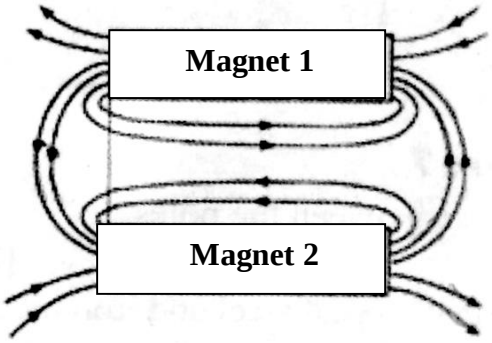


Figure 4

Indicate on the diagram the poles of each magnet. (1 mark)

22. 2015 Q4 P2

Figure 2 shows a soft iron bar AB placed in a coil near a freely suspended magnet.

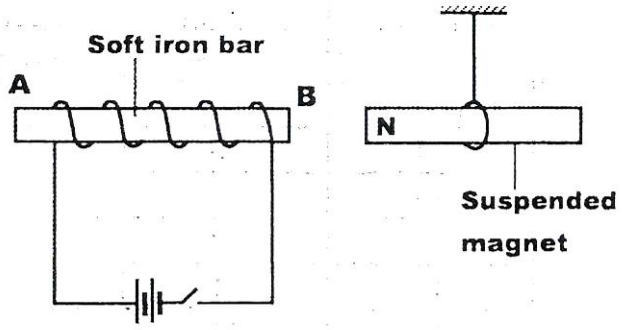


Figure 2

Explain the observation made when the switch is closed. (2 marks)

23. 2011 Q2 P2

An un-magnetized steel rod is clamped facing North-South direction and then hammered repeatedly for some time. When tested, it is found to be magnetized. Explain this observation. (2 marks)

MEASUREMENT II

1. 1995 Q1 P1

   Name the instrument that would be most suitable for measuring the thickest of one sheet of this question paper. (1 mark)

2. 1995 Q1 P1

   State the assumption made when calculating the size of a molecule in the thin oil film experiment (1mark)

3. 1996 Q1 P1

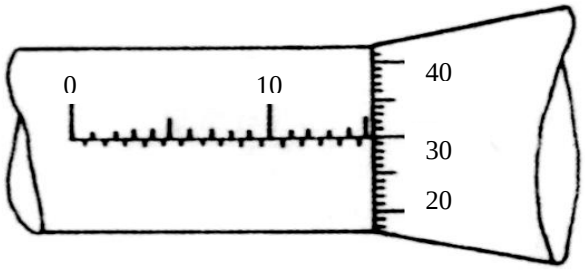


FIG. 1

The micrometer screw gauge represented by figure 1 has thimble scale of 50 divisions. What is the reading shown (1 mark)

4. 1997 Q6 P1

   The number of molecules in $18cm^3$ of a liquid is 6×10^{23}. Assuming that the diameter of the molecules is equivalent to the side of a cube having

the same volume as the molecule. Determine the diameter of the molecule.

5. 1999 Q1 P1

What is the reading on the vernier callipers shown in figure 1? (1mark)

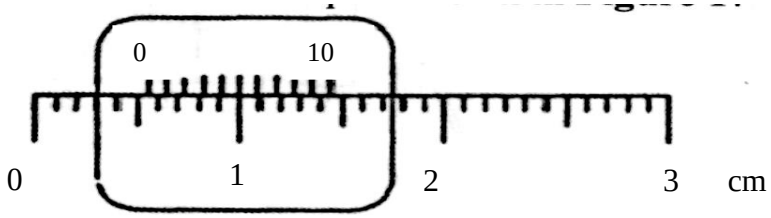


Figure 1

6. 2001 Q3(a) P1

You are provided with the following: a large
shallow tray water lycopodium powder
some olive oil
either a piece of thin wire with a kink and a millimeter scale or a
burette a metre rule.

Describe an experiment to estimate the diameter of a molecule of the olive oil.

(7 marks)

7. 2002 Q1 P1

Fig one shows a micrometer crew gauge being used to measure the diameter of a metal rod. The thimble scale has 50 divisions

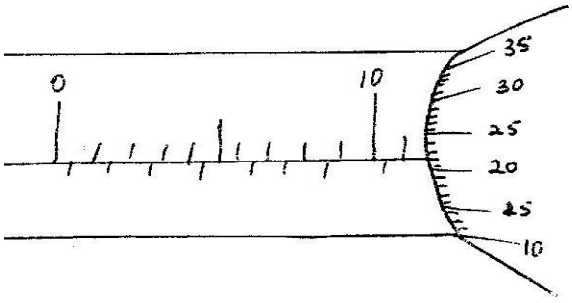


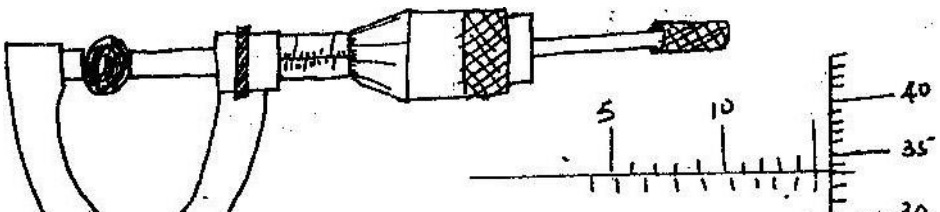
Fig. 1

What is the reading shown?

8. 2004 Q1 P1

Figure 1 shows a micrometer screw gauge being used to measure the diameter of a ball bearing.

A magnified portion of the scale is shown.



Record the diameter of the ball bearing (1mark)

9. 2004 Q2(b) P1

Fig 3 shows part of an experimental set up for estimating the diameter of an oil molecule.

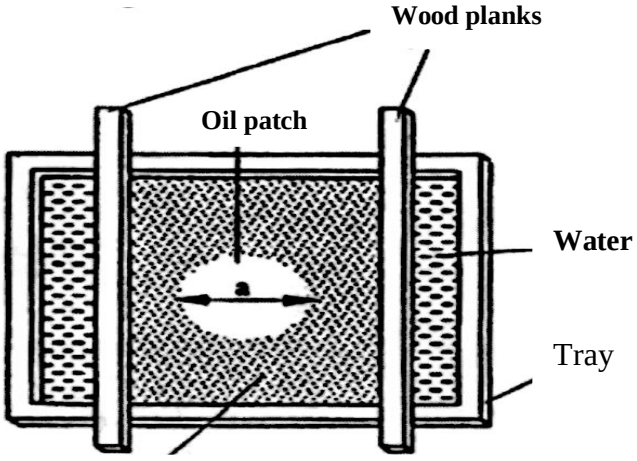


Figure 3

i) Describe how the oil patch is formed

ii) In an experiment the diameter a, of the patch was measured to be 200mm for an oil drop of radius 0.25mm. Determine the diameter of the molecule of the oil.

10. 2005 Q27 P1

The melting point of oxygen is given as -273^{0}C. Covert this temperature to Kelvin (K) (1 mark)

11. 2006 Q14 (b) &(c) P1

(b) In an experiment to estimate the diameter of an oil molecule, an oil

drop of diameter 0.05 cm spreads over a circular patch whose diameter is 20 cm

Determine

(i) The volume of the oil drop (2 marks)

(ii) The area of the patch covered by the oil (2 marks)

(iii) The diameter of the oil molecule (3 marks)

(c) State

(i) Any assumption made in (b) (iii) above (1 mark)

(ii) Two possible sources of errors in this experiment (2 marks)

12. 2007 Q1 P1

Figure 1 shows a metal cube of mass 1.75g placed between the jaws of a micrometer screw gauge. The magnified portion of the scale is also shown. The reading on the gauge when the jaws were fully closed without the cube was 0.012 cm. Use this information and the figure to answer questions 12 and 13

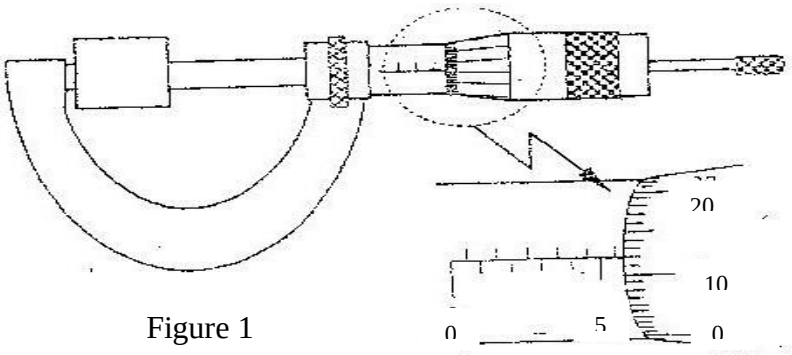


Figure 1

What is the length of the cube? (1 mark)

13. 2007 Q2 P1

Determine the density of the metal cube giving your answer correct to three significant figures. (3 marks)

14. 2010 Q1 P1

Figure 1 shows a vernier caliper being used to measure the internal diameter of a tube.

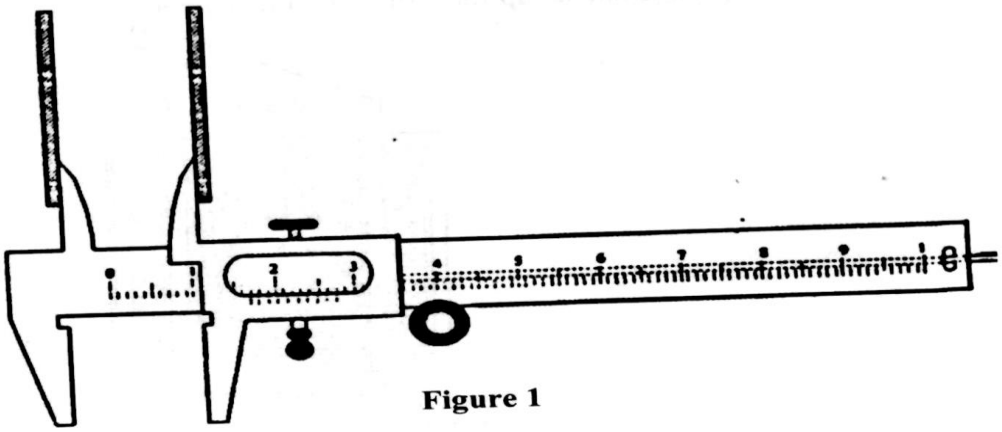


Figure 1

Record the diameter of the tube (1 mark)

15. 2010 Q2 P1

A stop watch started 0.50s after the started the start button was pressed. The time recorded using the stopwatch for a ball bearing failing through a liquid was 2.53s. Determine the time of fail.

16. 2010 Q9 P1

When a drop of oleic acid of known volume is dropped on the surface of water in a large trough, it spreads out to form a large circular patch. State one assumption made when the size of the molecule of oleic acid is estimated by determining the area of the patch. (1 mark)

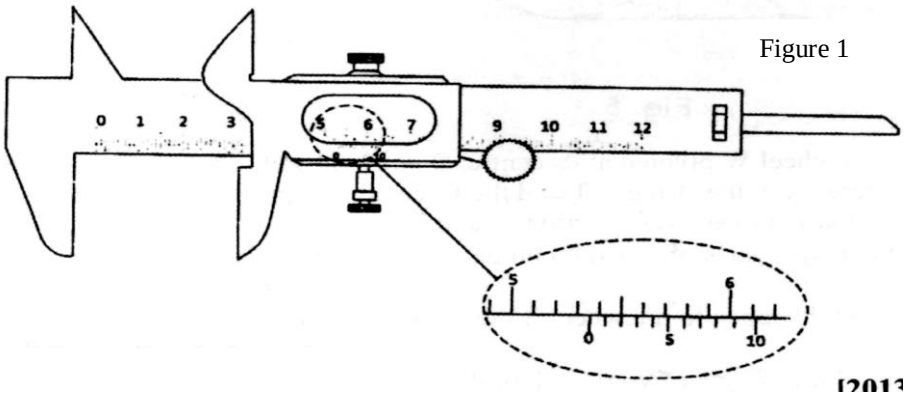
17. 2012 Q6 P1

State two environmental hazards that may occur when oil spills over a large surface area of the sea. (2marks)

18. 2013 Q1 P1

Figure 1 shows part of the main scale and vernier scale of a vernier calipers.

Figure 1



Record the reading indicated. (1 mark)

19. 2014 Q2 P1

Figure 1 shows a magnified scale of a micrometer screw gauge.

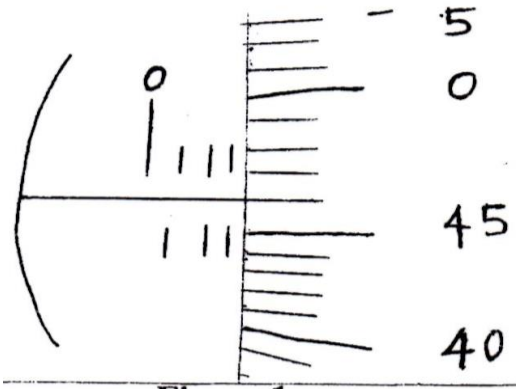


Figure 1

Record the reading indicated. (1 mark)

20. 2014 Q6 P1

An oil drop of volume V m^3 introduced on the surface of water spreads to form a patch whose area is A m^2. Derive an expression or obtaining the diameter, d of a molecule of oil. (2 marks)

21. 2015 Q 1 P1

Figure 1 shows part of the main scale of a vernier Calipers.

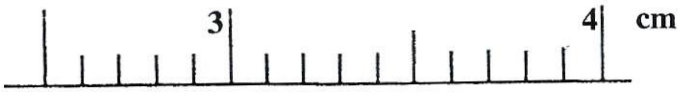


Figure 1

Insert the vernier scale to the main scale, to show a reading of 3.14 cm (1 mark)

22. 2016 Q 3 P1

When a drop of an organic acid of known volume is dropped on the surface of water in a large trough, it spreads to form a large circular .patch. State one assumption made when the size of the .molecule of the acid is estimated by determining the area of the patch. (1 mark)

TURNING EFFECT OF A FORCE

1. 1995 Q17 P1

The diagram in figure 5 shows a beam negligible weight balanced by constant forces P and Q.

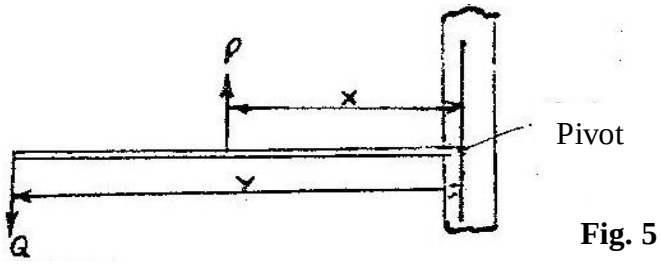


Fig. 5

Derive the relationship between x and y (2 marks)

2. 1996 Q14 P1

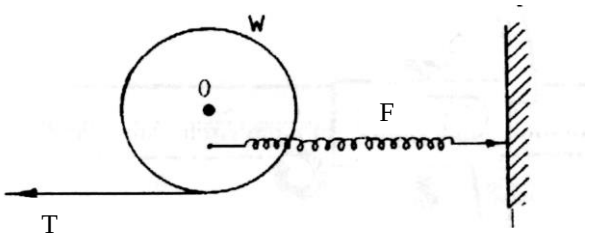


Fig. 5

Figure 5 shows a wheel W pivoted at its centre, O and held stationary by a string and a spring. The tension in the strings is T and the force on the springs is F.

Use this information to answer 2 and 3

State how the magnitudes of T and F compare. Give reasons for your answer (3 marks)

3. 1996 Q15 P1

State what would happen to the wheel if the string snapped (1 mark)

4. 1996 Q30 P1

The moment of the weight of vertical door does not significantly affect the moment of the force required to open the door. Give a reason for this (1 mark)

5. 1997 Q2 P1

Figure 2 shows a rigid body acted upon by a set of forces. The magnitudes of the forces are as follow

$F_1 = 3N_1$, $F_2 = 6N$, $F_3 = 3N$, $F_4 = 4\ N_1$, $F_5 = 3N$ and $F_6 = 3\ N$

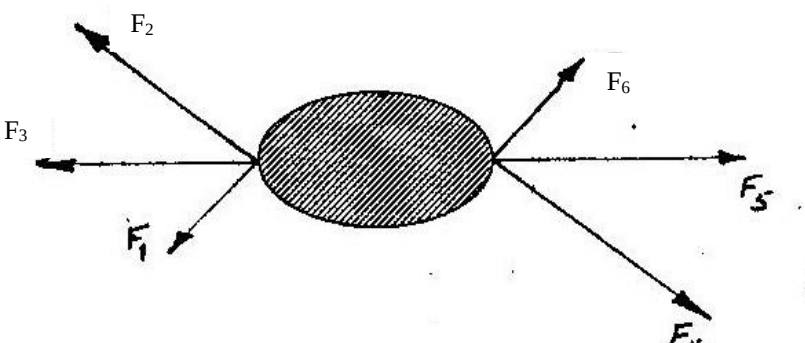


Fig. 2

F_5

F_1

Fig. 2

F_4

Identify the couple among these forces

6. 1999 Q2 P1

Figure 2 shows forces F_1 and F_2 acting on a meter rule such that it is in equilibrium.

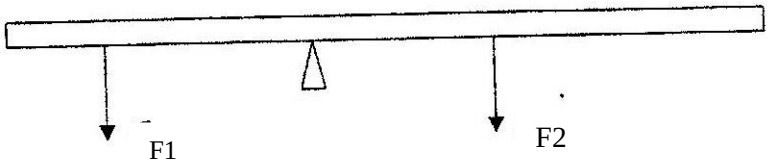


Fig 2

Mark on the figure a third force F3 acting on the rule such that it is in equilibrium maintained.

7. 1999 Q14 P1

Determine the moment of the couple shown in figure 10. (2 marks)

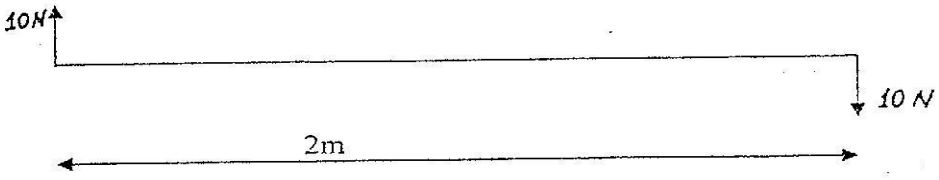


Fig 10

8. 2000 Q5 P1

Fig. 3 shows a device for closing a steam outlet.

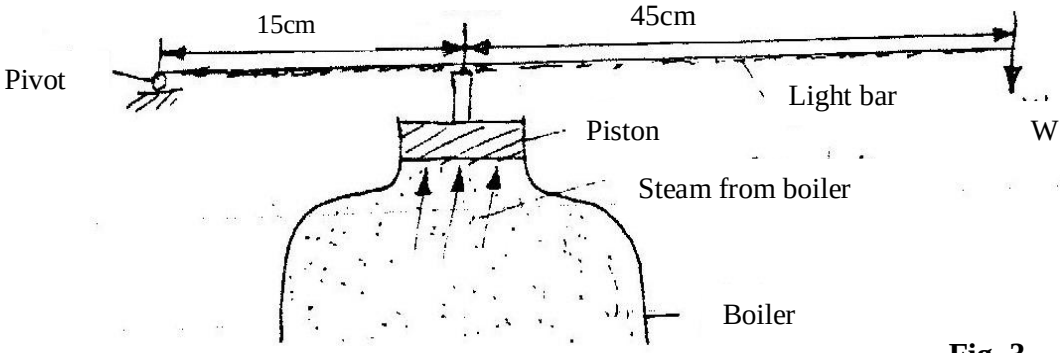


Fig. 3

The area of the position is 4.0×10^{-4} m^2 and the pressure of the steam in the boiler is 2.0×10^5 Nm^3. Determine the weight W that will just hold the bar in the horizontal position shown.

9 . 2000 Q14 P1

In **fig 9** the couple represented by forces F1 is acting on light uniform bar.

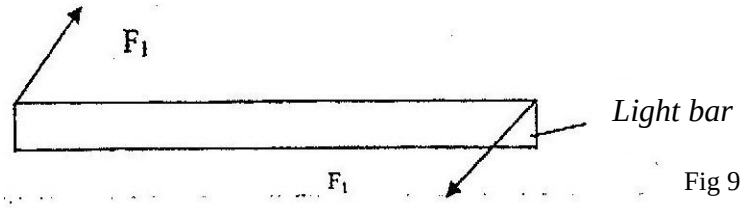


Fig 9

Sketch on the figure a couple represented by forces F_2 such that the bar is in equilibrium. And the forces F_2 have minimum magnitude.

10. 2001 Q12 P1

Fig. 9 shows a uniform light bar one meter in length in equilibrium under the action of forces F_1 F_2 F_3 and F_4. All the forces are in the same plane.
Use the information on the figure to answer questions 11 and 12.

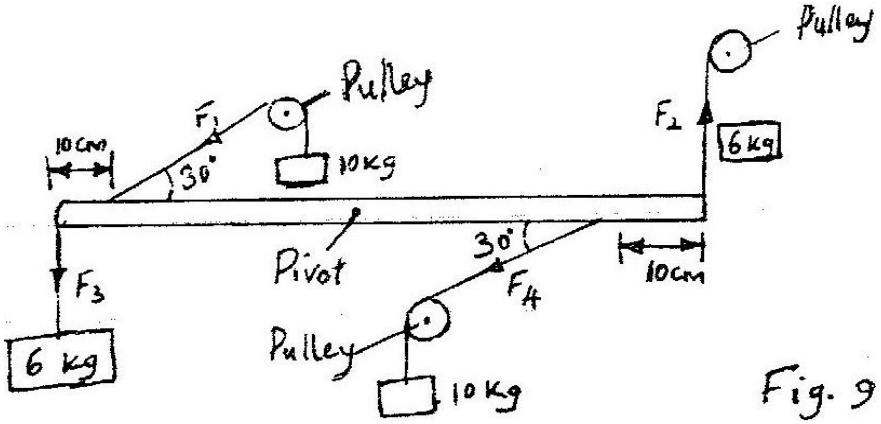


Fig. 9

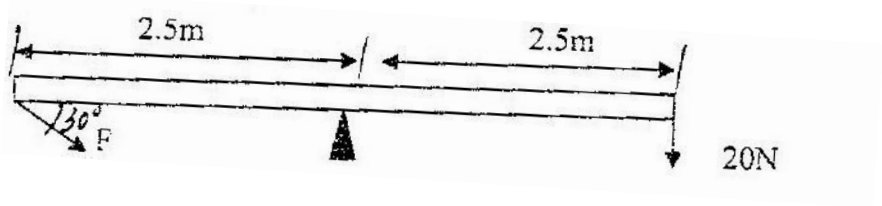
Name one set of forces on the figure that constitutes a couple.

11. 2001 Q13 P1

Determine the moment of the couple named in question 11.

12. 2003 Q14 P1

Figure 9 shows a uniform bar in equilibrium under the action of two forces.



Determine the value of F (3 marks)

13. 2004 Q14 P1

The system in figure 9 is in equilibrium.

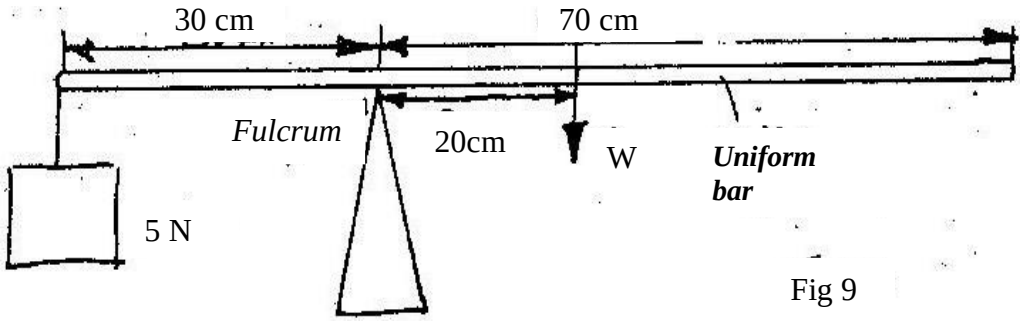


Fig 9

Determine the weight of the bar.

14. 2008 Q19 P1

a) State the principle of moments. (1 mark)

b) A uniform metal strip is 3.0cm wide, 0.6cm thick and 100cm long.
The density of the metal is 2.7 g/cm$^{3.}$

(i) Determine the weight of the strip. (3 marks)

The strip placed on a pivot and kept in equilibrium by forces as shown in fig. 13

is placed on a pivot

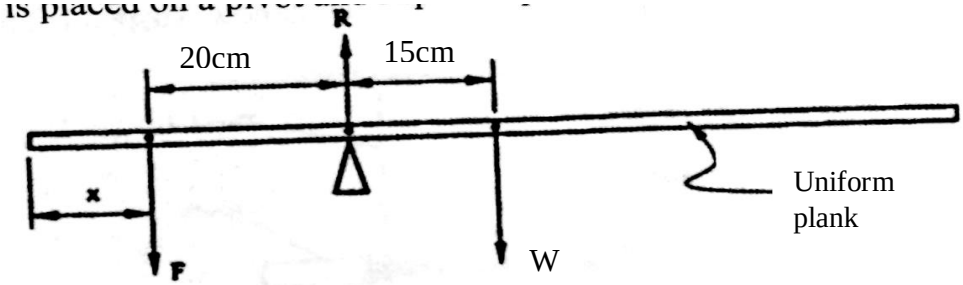


Figure 13

(2

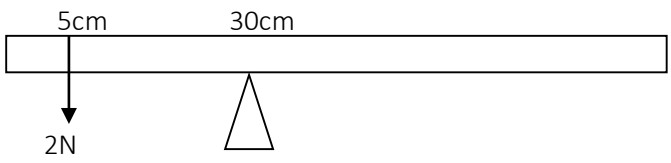
(ii) Determine the value of F and R (3 marks)

(iii) X is the distance from the end of the plank to the point of application of force F. Force F is now applied at various points nearer to the pivot so that x increases. Equilibrium is maintained all the time. On the axes provided sketch the relation between force F and x.

(iv) Give a reason for the answer in (iii) above (1 mark)

15. 2010 Q6 P1

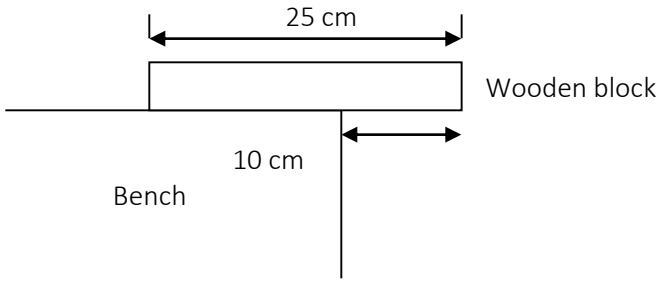
Figure 3 shows a uniform meter rule pivoted at 30cm mark. It is balanced by weight of 2N suspended at the 5cm mark.



Determine the weight of the metre rule.

16. 2011 Q11 P1

Figure 8 shows a uniform wooden block of mass 2kg and length 25cm lying on a bench. It hangs over the edge of the bench by 10cm.Use the figure to answer questions 19 and 20.



Indicate on the figure two forces acting on the wooden block. (1 mark)

17. 2011 Q12 P1

Determine the minimum force that can be applied on the wooden block to make it turn about the edge of the bench. (2 marks)

18. 2013 Q2 P1

State one factor that affects the turning effect of a force on a body. (1 mark)

(2 marks)

19. 2013 Q8 P1

Figure 4 shows a uniform meter rule of weight 1 N with two weights of 0.18 N and 0.12 N suspended from its ends.

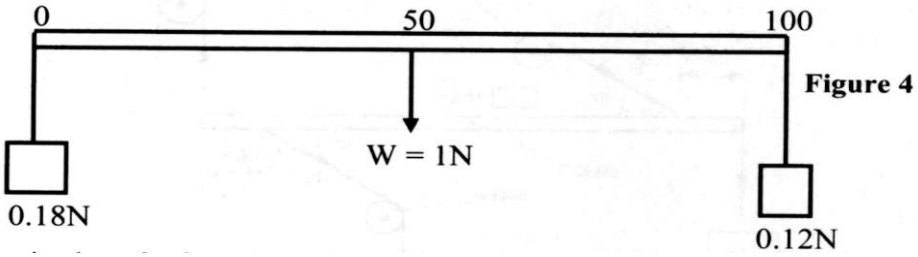


Figure 4

Determine how far from the 0.18 N weight a pivot should be placed in order to balance the meter rule. (3 marks)

20. 2014 Q8 P1

Figure 5 shows a uniform rod 4 m long and of mass 2 kg. It is pivoted 1m from one end and balanced horizontally by a string attached near the other end.

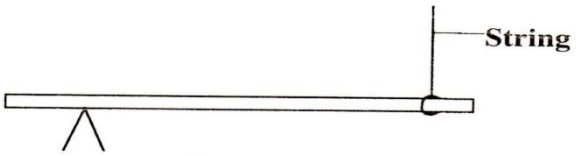


Figure 5

Determine the position where a mass of 5 kg should be placed on the rod so that the rod remains horizontal and the tension in the string is zero. (3 marks)

21. 2015 Q8 P1

Figure 4 shows a uniform metal rod balanced at it's centre by different forces.

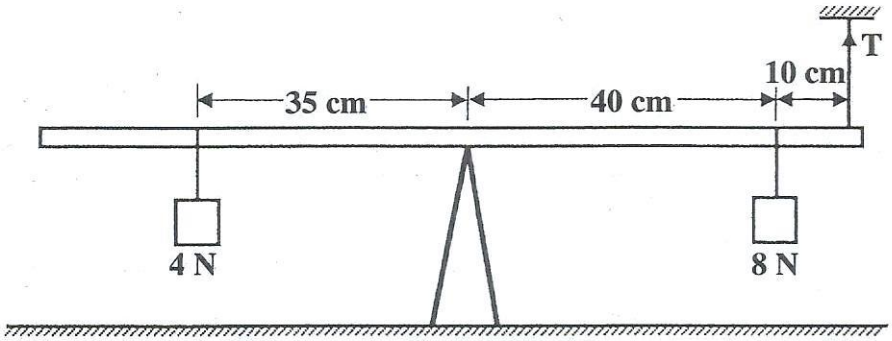


Figure 4

Determine the value of T. (3 marks)

EQUILIBRIUM AND CENTRE OF GRAVITY

1. 1995 Q33 P1

   What is meant by the centre of gravity of a body? (1 mark)

2. 1996 Q3 P1

   State two factors that should be controlled in manufacturing a cylindrical container of uniform thickness, which should normally be in a standing position? (2 marks)

3. 1997 Q2b P2

   In the set up in the figure 3, the metre rule is in equilibrium

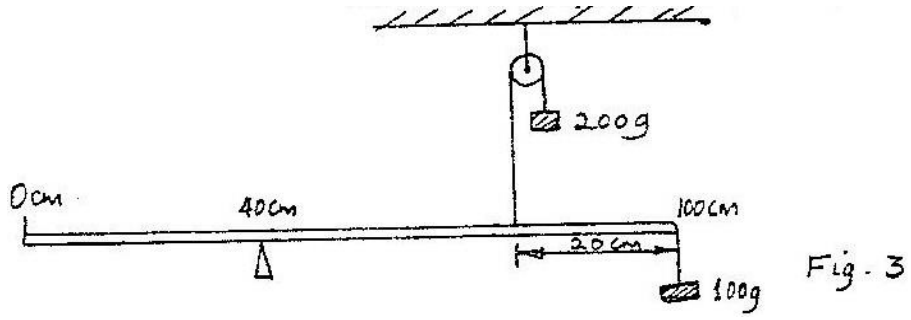


Fig. 3

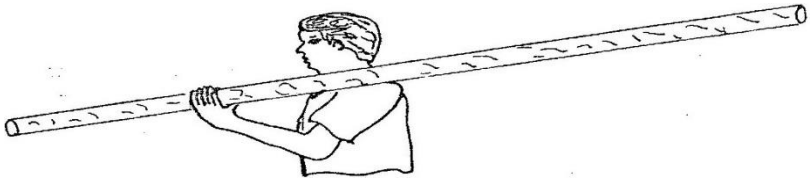
   Given that the metre rule is uniform, determine its weight (2 marks)

4. 1998 Q7 P1

   State one advantage of fitting wide tyres on a vehicle that moves on earth roads.

5. 1998 Q24 P1

   John carried a uniform post of mass 20kg horizontally on his shoulder as shown in fig 6. He placed the post on his shoulder such that the centre of gravity of the pole is 1.0m behind him. He balanced the post by applying a downward force F at a point 0.5m on the part of the post in front of him.



Determine the value of the force F. (3 marks)

6. 1999 Q2 P1

Figure 2 shows forces F_1 and F_2 acting on a meter rule such that it is in equilibrium.

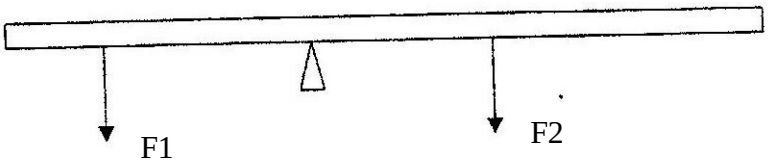


Fig 2

Mark on the figure a third force F_3 acting on the rule such that it is in equilibrium maintained. (1 mark)

7. 1999 Q3 P1

State how the position of the centre of gravity of a body in stable equilibrium changes to that in the rest position when the body is slightly tilted and then released.

(1 mark)

8. 2000 Q3 P1

Fig. 2 shows a beaker placed on a bench. of ice is placed in the beaker as shown.

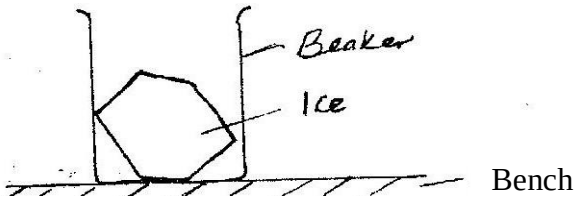


Fig. 2

State and explain the change in the stability of the beaker when the ice melts. (1 mark)

9. 2001 Q3 P1

Fig 3 shows two identical hollow spheres. Spheres A is completely filled with the liquid while B is partly filled with identical liquid.

Fig. 3

When the two spheres are rolled gently on a horizontal surface. It is observed that the sphere B stops earlier that the sphere A. Explain this observation. (2 marks)

10. 2002 Q2 P1

Fig. 2 represents a rock balanced at point O.G is the centre of gravity of the rock. Use this information to answer questions 5 and 6.

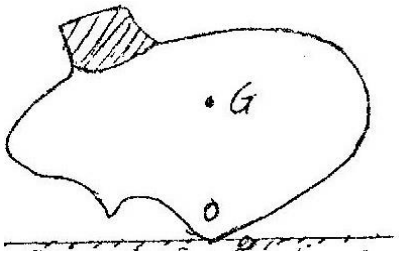


Fig 2

Draw and label on the figure, the forces acting on the rock. (2 marks)

11. 2002 Q3 P1

If the portion of the rock represented by the shaded part is chopped off explain why the rock may topple to the right. (2 marks)

12. 2002 Q12 P1

Fig. 7 shows a non – uniform log of mass 100kg balanced on the pivot by a 2kg mass placed as shown.

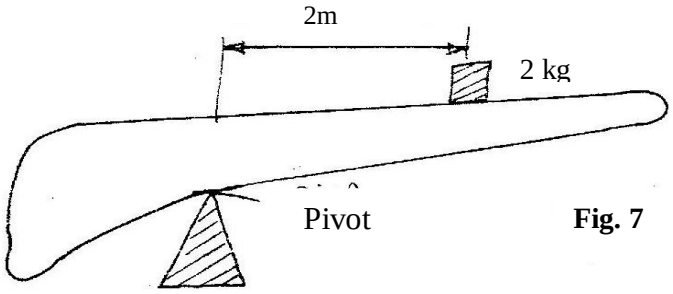


Fig. 7

Determine the distance of the center of gravity of the log from the pivot. (3 marks)

13. 2003 Q3 P1

Figure 3 shows two identical trolleys with loads A and B. The loads are identical in shape and size.

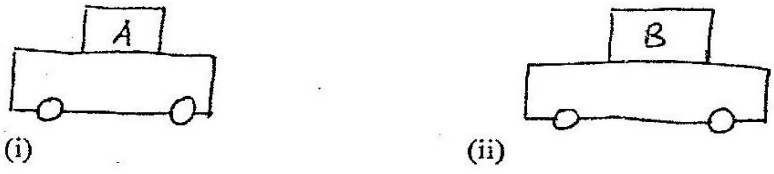


Figure 3

Given that the density of A is greater than that of B, explain why the trolley in figure 3(ii) is more suitable. (2 marks)

14. 2004 Q3 P1

Fig 3 shows a rectangular block of wood with a hollow section (inside) at the position shown.

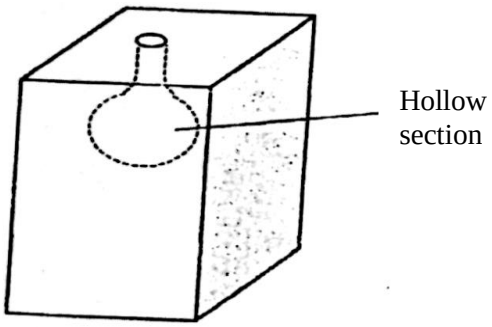


Figure 3

The block is resting on a Horizontal bench

(i) State the effected on the stability of the block when the hollow section is filled with water. (1 mark)

ii) Explain your answer in (i) above. (2 marks)

15. 2004 Q14 P1

The system in figure 9 is in equilibrium.

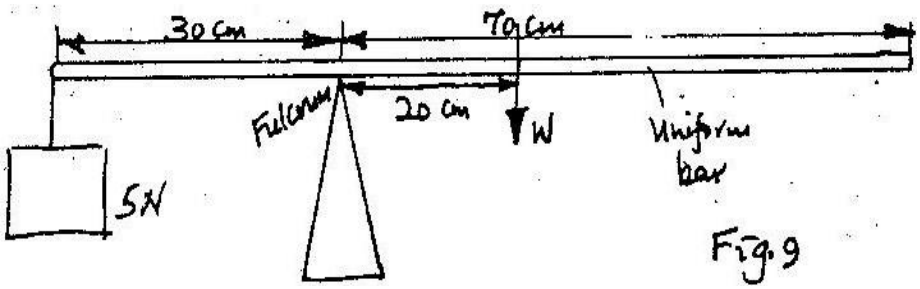
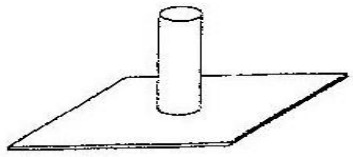


Fig. 9

Determine the weight if the bar. (1 mark)

16. 2005 Q2 P1

Fig 2 shows a solid cylinder standing on a horizontal surface. The cylinder is in stable equilibrium.



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

17. 2006 Q4 P1

Figure 3 shows a bimetallic strip with a wooden handle, suspended horizontally using a thin thread.

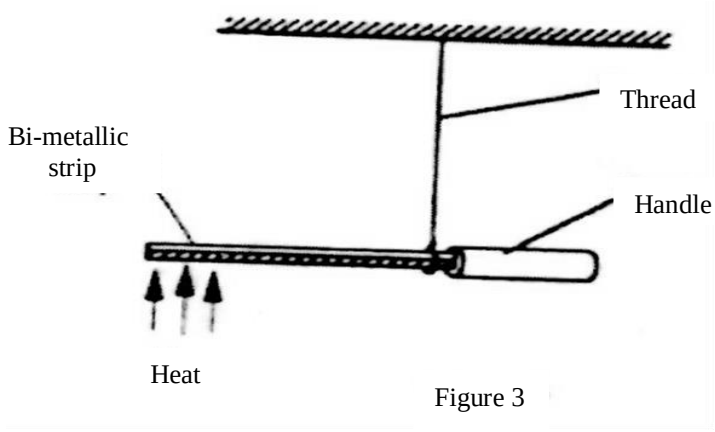


Figure 3

The strip is heated at the point shown. Explain why the system tips to the right (1 mark)

18. 2007 Q8 P1

Figure 5 shows a uniform bar of length 1.0 m pivoted near one end. The bar is kept in equilibrium by a spring balance as shown.

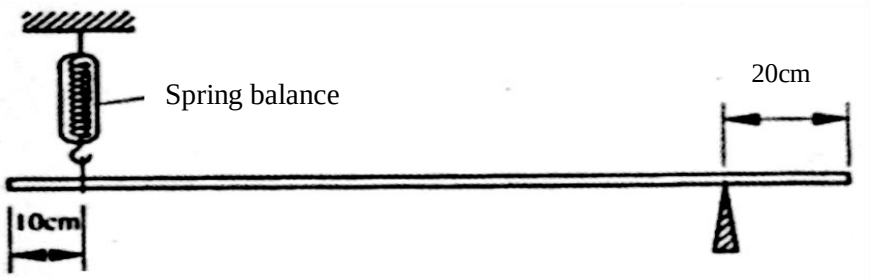


Figure 5

Given that the reading of the spring balance is 0.6 N. Determine the weight of the bar. (3 marks)

19. 2008 Q10 P1

Fig. 5 shows a toy resting on top of a closed bottle. Use the information on the figure to answer questions 10 and 11.

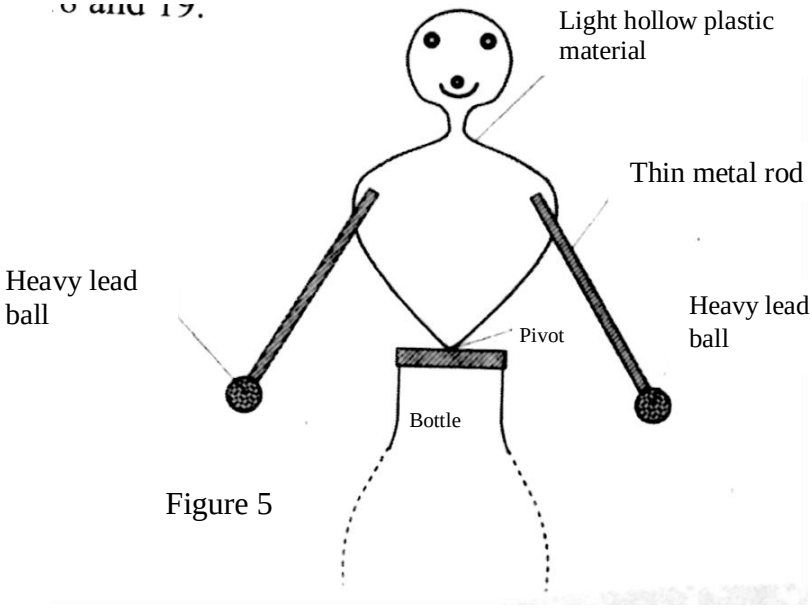


Figure 5

Mark on the diagram, point Q, the approximate centre of gravity of the toy. (1 mark)

20. 2008 Q11 P1

Giving a reason, name the state of equilibrium of the toy. (2 marks)

21. 2008 Q14 P1

The system in Fig. 8 is in equilibrium

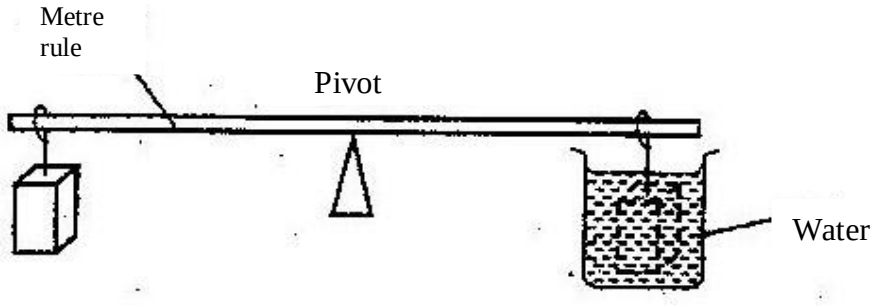


Figure 8

When the temperature of the water is raised the system is observed to tilt to the right, state the reason for this observation. (2 marks)

22. 2008 Q19 P1

a) State the principle of moments. (1mark)

b) A uniform metal strip is 3.0cm wide, 0.6cm thick d 100cm long. The density of the metal is 2.7 g/cm$^{3.}$

(i) Determine the weight of the strip. (3marks)

The strip placed n a pivot and kept in equilibrium by forces as shown in fig. 13

R

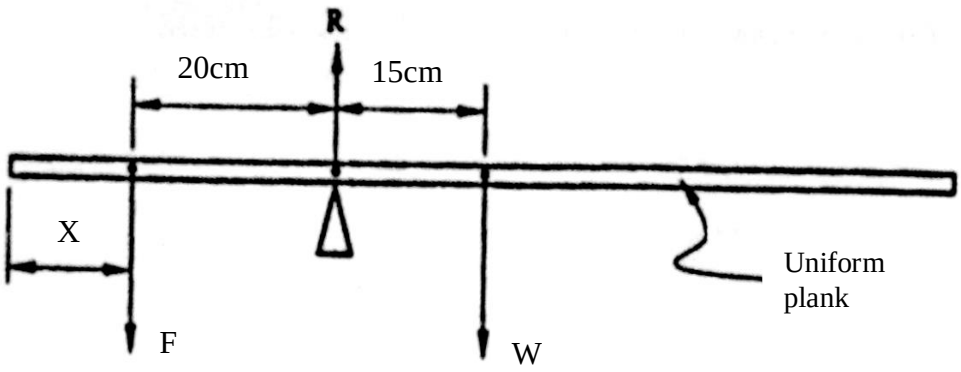


FIGURE 13

(ii) Determine the value of F and R (3marks)

(iii) X is the distance from the end of the plank to the point of application of force F. Force F is now applied at various points nearer to the pivot so that x increases. Equilibrium is maintained all the time. On the axes provided sketch the relation between force F and x.

(iv) Give a reason for the answer in (iii) above (1mark)

23. 2009 Q9 P1

Figure 4 shows a uniform cardboard in the shape of a parallelogram

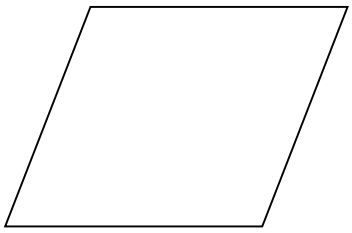
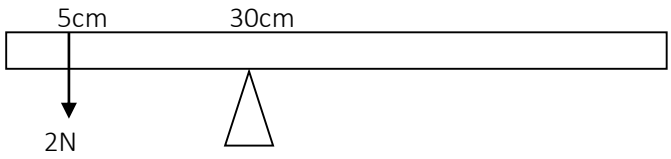


Fig. 4

Locate the centre of gravity of the cardboard. (1 mark)

24. 2010 Q6 P1

Figure 3 shows a uniform metre rule pivoted at 30cm mark. It is balanced by weight of 2N suspeded at the 5cm mark.



Determine the weight of the metre rule.

25. 2010 Q14 P1

Figure 6 shows an athlete lifting weights while standing with the feet apart.

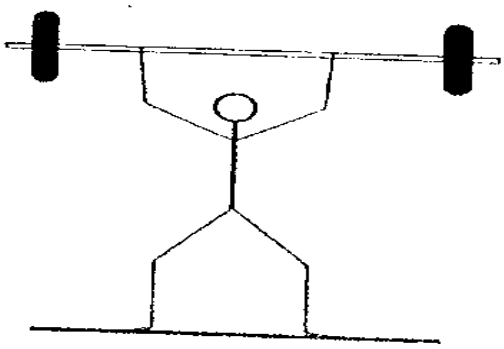


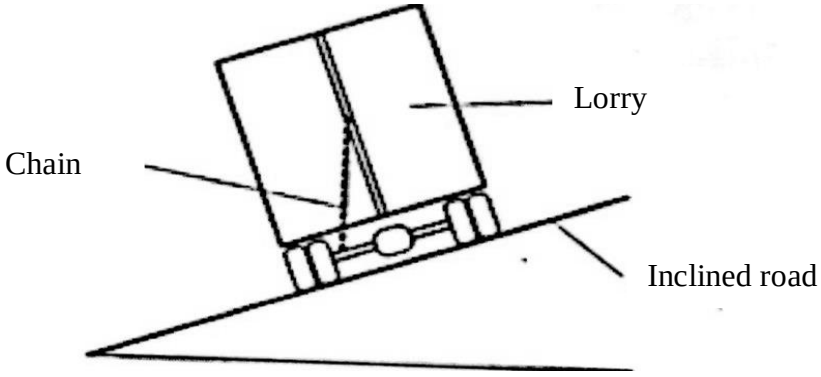
Figure 6

Explain why standing with the feet apart improves an athlete's stability.

(1 mark)

26. 2011 Q9 P1

Figure 1 shows a lorry moving on an inclined section of a straight road. At the back is a chain hanging from a point on a horizontal axis through the centre of gravity of a lorry.



State with a reason whether the lorry is stable or not stable. (1 mark)

27. 2012 Q9 P1

State the reason why a steel sphere resting on a horizontal surface is said to be neutral equilibrium. (1 mark)

28. 2012 Q18(a) P1

(a) **Figure 12** shows a set up used to determine the mass of a solid S.

The rod is pivoted at its centre of gravity C.

A B C D E

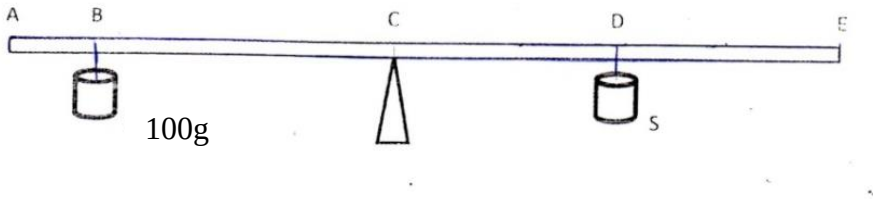


Figure 12

(i) State two measurements that need to be made to determine the mass of solid S. (1mark)

(ii) Write an expression to show how the measurements in (i) above are used to obtain the mass of S. (2marks)

29. 2014 Q9 P1

Figure 6 shows two identical rods JK and LK connected with a hinge at K.

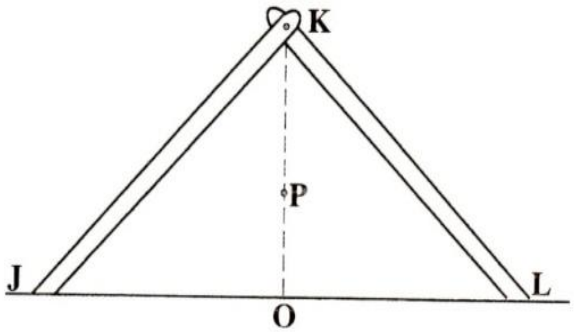


Figure 6

The position of the centre of gravity for the system is at P. The arrangement is now adjusted so that J and L move equal distances towards O. Sketch the new arrangement on the same diagram and mark the new position of the centre of gravity. (2 marks)

29. 2016 Q1 P1

Figure 4 shows a uniform cardboard in the shape of a parallelogram

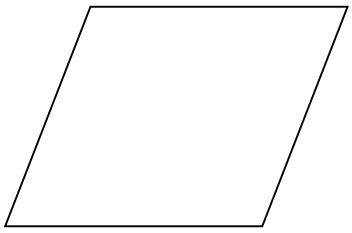


Fig. 4

Locate the centre of gravity of the cardboard. (1 mark)

REFLECTION AT CURVED SURFACES

1. 1994 Q1a P2

Draw a ray diagram to show what is meant by

(i) The principal focus and

(ii) The focal length of a concave mirror. (3 marks)

2. 1995 Q36 P1

Explain with the aid of a labelled ray diagram the wide field of view of a convex mirror (2 marks)

3. 1995 Q3a P2

(a) An object O is placed in front of convex mirror as shown in figure 2

Fig 2

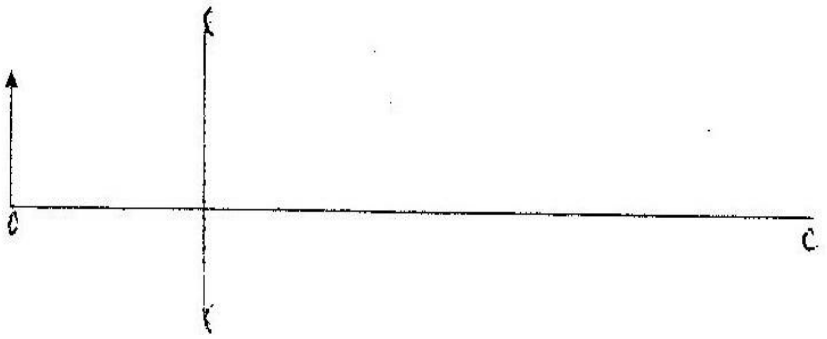


Fig. 2

(i) Draw to scale a ray diagram to show the position of the image (5 marks)

(ii) Determine the magnification (3 marks)

4. 1996 Q22 P1

A lady holds a large concave of focal length 1 m 80 cm from her face, state two characteristics of her image in the mirror (2 marks)

5. 1997 Q26 P1

Figure 9 shows two parallel rays incident on a concave mirror. F is the focal point of the mirror.

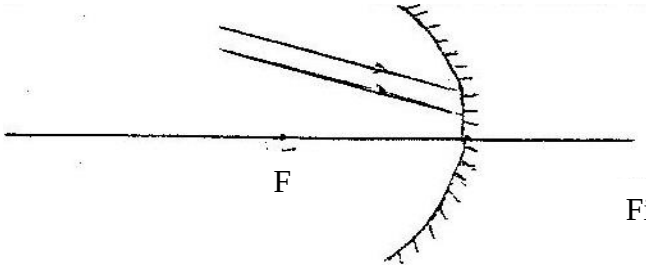


Fig. 9

Sketch on the same diagram the path of the rays after striking the mirror

6. 1997 Q7 P2

a) **Fig. 6** shows an object, 0.3cm high placed in front of a concave mirror. C is the centre of curvature of the mirror. The diagram is drawn to scale: (1cm: 2cm)

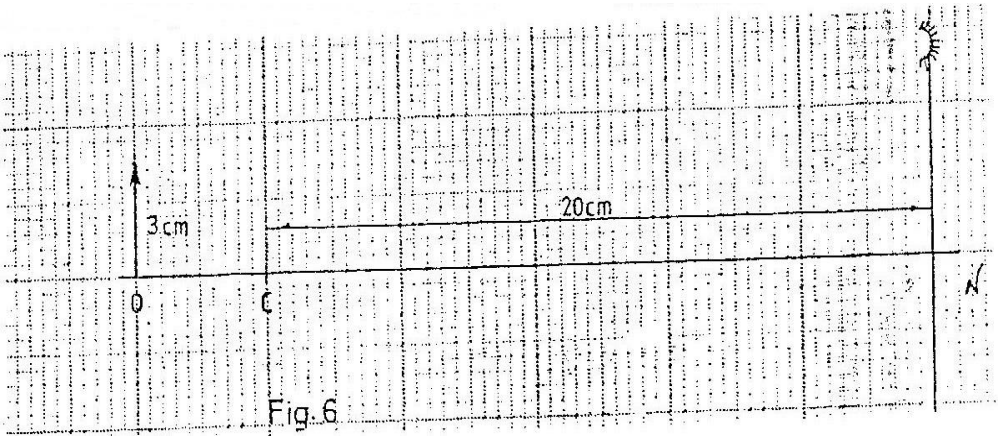


Fig. 6

Draw a ray diagram, on **figure 6**, and determine the size of the image produced.

b) **Table 3** shows the object distance y and the corresponding image distance v, for an object placed in front of a concave mirror.

U(cm	20	25	30	40	50	70
V(cm	20	16.7	15	13.3	12.0	11.6
1/v(cm-1)						
V(cm-1)						

i) Complete the table and plot a graph of 1/v (y-axis) against 1/u (give your answers to 3 decimal places). (7 marks)

ii) From the graph, determine the focal length of the mirror. (3 marks)

7. 2000 Q23 P1

Fig. 12 shows a ray of light incident on a convex mirror.

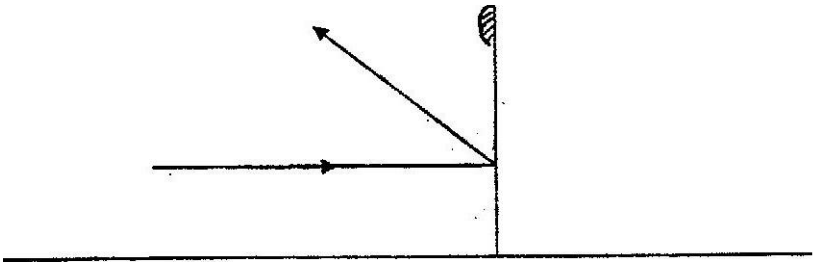


Fig 12

Using a suitable construction on the same diagram determine the radius of curvature of the mirror. (3 marks)

8. 2000 Q1 P2

a) i) State one application of each of the following.

Convex mirror-

Parabolic mirror – (2 marks)

ii) Fig. 1, which is drawn to a scale of 1:5, represents an object O

and its image 'I' formed by a concave mirror.

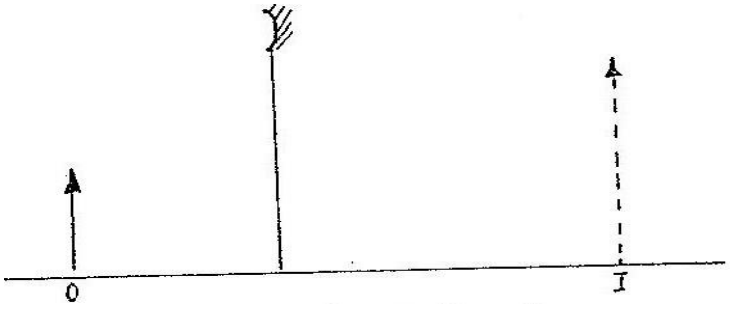
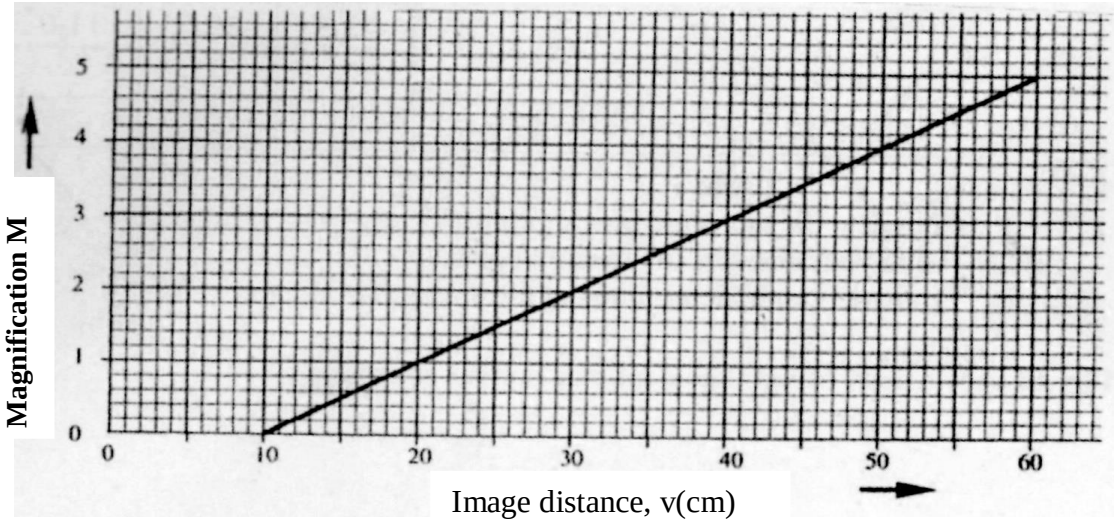


Fig. 1

By drawing suitable rays, locate and mark on the figure the position of the principal focus 'F' of the mirror. Determine the focal length f. (4 marks)

b) The graph in **Fig. 2** shows the variation of magnification, M with image distance, V for a concave mirror.



Determine:

i) The object position when the image position is 45cm (4 marks)

ii) The focal length of the mirror. (1 mark)

9. 2001 Q20 P1

Fig. 13 shows a point object O placed in front of a concave mirror.

Draw appropriate rays to locate the image of the object.

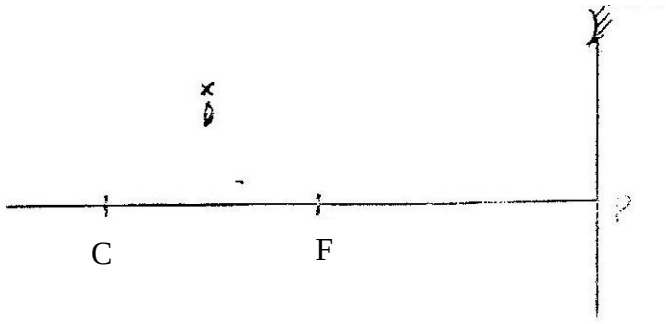
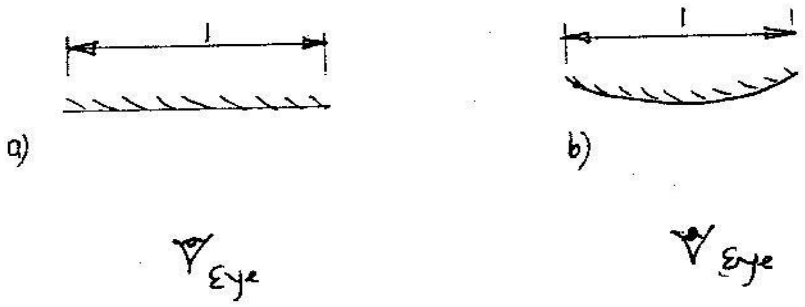


FIG. 13

10. 2003 Q29 P1

Figure 16 (a) and (b) show a convex mirror and a plane mirror of equal aperture.

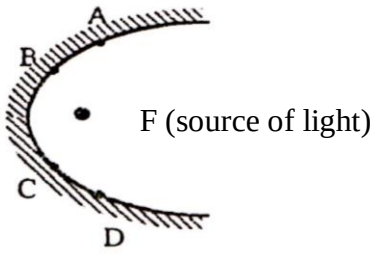


By sketching a pair of incident and reflected rays for each (a) and (b) show how the convex mirror provides to the eye, a wider field of view than the plane mirror.

11. 2004 Q23 P1

Figure 12 shows a parabolic surface with a source of light placed at its focal point F

Figure 12



Draw rays to show reflection from the surface when rays from the source strike the surface at points ABC and D.

12. 2005 Q22 P1

Fig. 12 shows a vertical object, O, placed in front of a convex mirror.

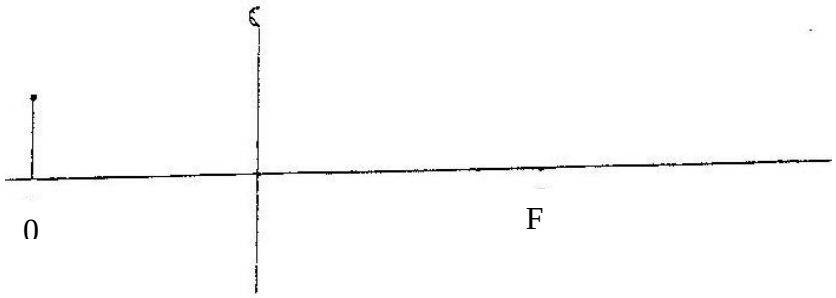


Fig 12

On the same diagram draw the appropriate rays and locate the image formed

(3 marks)

13. 2006 Q18(a) P1

Figure 8 shows an object placed in front of a concave mirror of focal length 10cm. C is the centre of curvature.

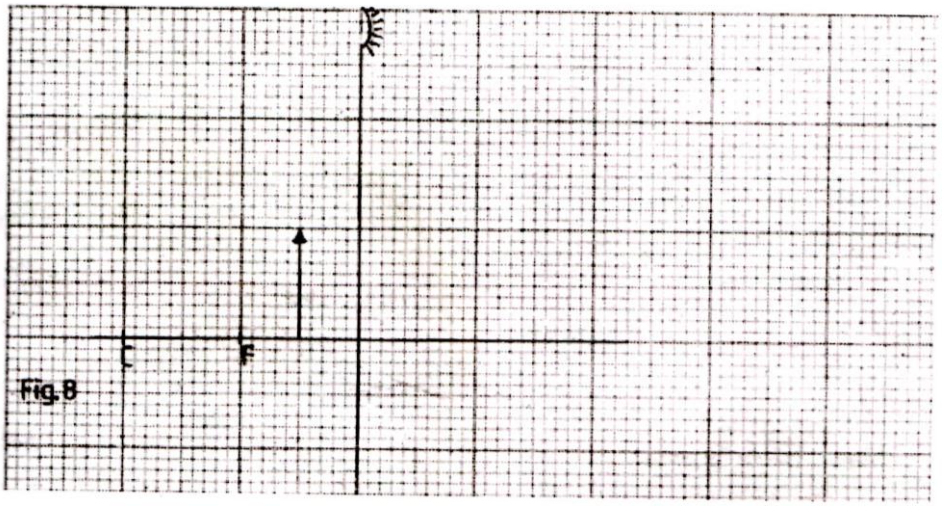


Fig. 8

(i) On the same figure draw a ray diagram showing the location of the image (4 marks)

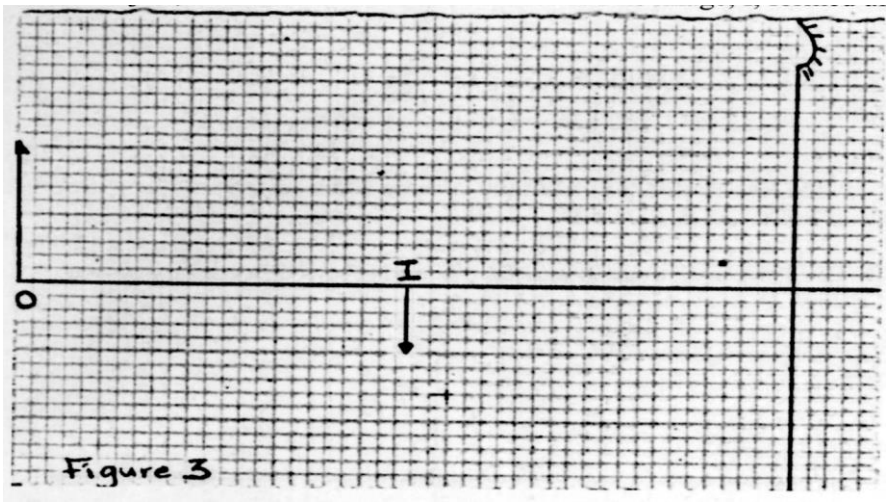
Use the ray diagram drawn in (i) above to determine the

(ii) Image distance (2 marks)

(iii) Magnification (2 marks)

14. 2007 Q4 P2

Figure 3 shows an object, O in front of a concave mirror and its image, I formed after reflection.



(a) On the same diagram draw appropriate ray (s) to locate the principal focus, F, of the mirror. (2 marks)

(b) Determine the focal length of the mirror (scale 1: 5) (1 mark)

15. 2010 Q5 P2

Figure 4, shows a bright electric lamp placed behind a screen which has a hole covered with wire gauze. A concave mirror of focal length 25cm is placed in front of the screen. The position of the mirror is adjusted until a sharp image of the gauze is formed on the screen.

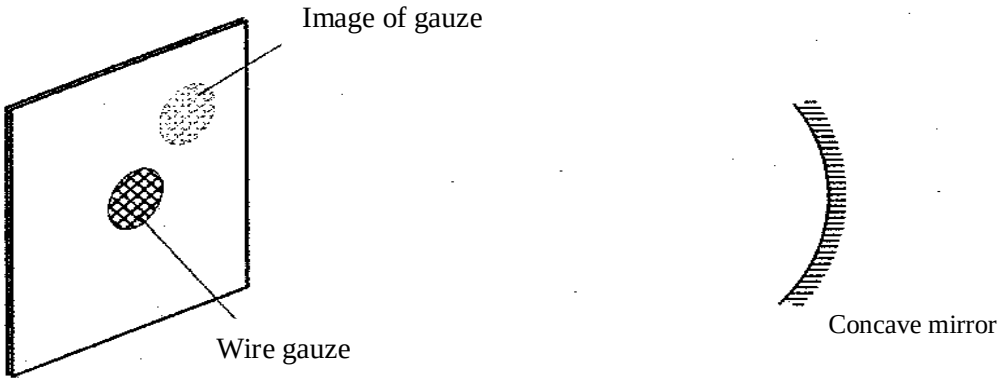


Figure 4

Determine the distance between the mirror and the screen. (1 mark)

16. 2012 Q17 P2

b) Figure 17 shows an object O placed in front of a converging mirror of focal length 15 cm.

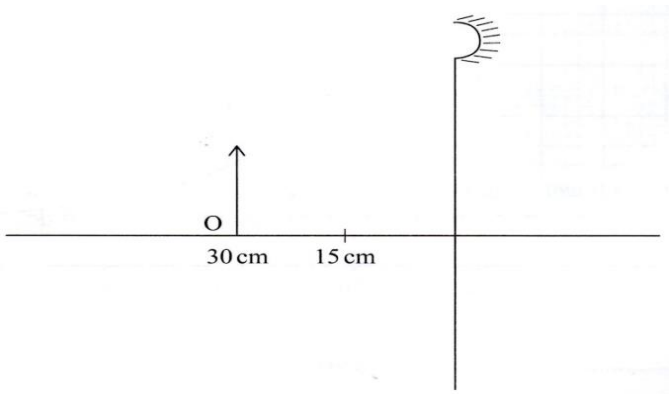


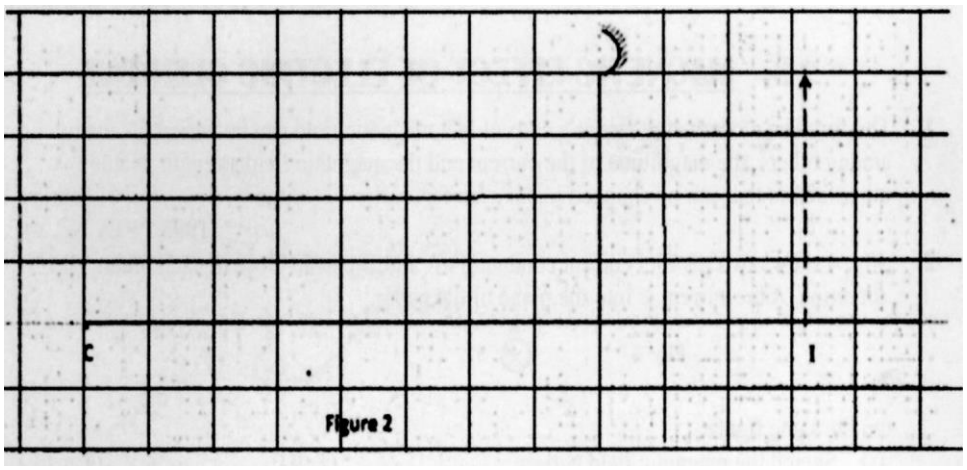
Figure 17

Draw on the figure a ray diagram to locate the image formed (3 marks)

c) State why parabolic reflectors are used in car headlights. (1 mark)

17. 2013 Q5 P2

Figure 2 shows the image of an object formed by reflection in a converging mirror. C is the centre of curvature of the mirror.



Complete the diagram to show:

(a) How incident rays are reflected to form the image: (2marks)

(b) The object position (1mark)

18. 2014 Q5 P2

Figure 2 shows circular waves originating from the principal focus F of a concave mirror and moving towards the mirror.

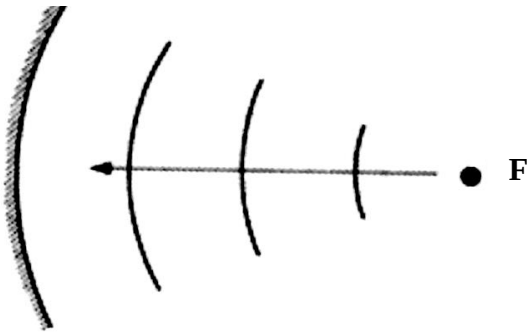


Figure 2

Complete the diagram to show the reflected waves. (1 mark)

19. 2015 Q5 P2

State the reason why a convex mirror is preferred over a plane mirror for use as a driving mirror. (1 mark)