2020 GROUP TEST ONE
Unit: Magnetism and Electromagnetism

SECTION A

1.

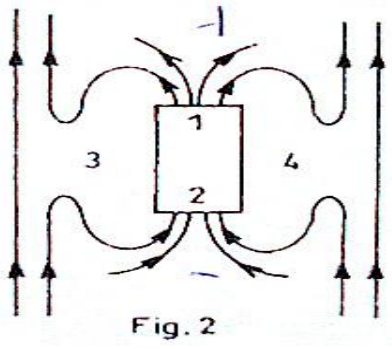


Fig. 2

Figure two shows the super position of the earth's magnetic field and the field due to a magnet. Identify point marked 1, 2, 3 and 4.

	1	2	3	4
A.	South pole	North pole	Neutral point	Neutral point
B	North pole	South pole	Neutral point	Neutral point
C.	Neutral point	Neutral point	North pole	South pole
D.	Neutral point	Neutral point	South pole	North pole

2. Which of these factors affect the magnitude of force on a current-carrying conductor in a magnetic field.

(i) The direction of current
(ii) the amount of current
(iii) the direction of the magnetic field
(iv) the strength of the magnetic field

a) (i) and (ii) b) (ii) and (iii)
c) (i) and (iii) d) (ii) and (iv)

3. A magnetic material can be magnetized by

(i) stroking with a permanent magnet
(ii) using a direct current
(iii) by induction

(a) (i) only
(b) (i) and (ii) only
(c) (ii) and (iii) only
(d) (i), (ii) and (iii)

4. Which of the following statements isn't true about a magnet?

A. Magnetic poles can't be separated
B. A paramagnetic material is a material from which strong magnets can be made
C. The neutral in a magnetic field is a point where there is no force experienced
D. Heating a magnet can reduce its magnetism

5. Four metals P, Q, R and S are tested for magnetism. Q attracts both P and R but not S. S does not attract P, Q or R. P and R sometimes attract one another and sometimes repel each other. Which of the following statements is correct about P, Q, R and S?

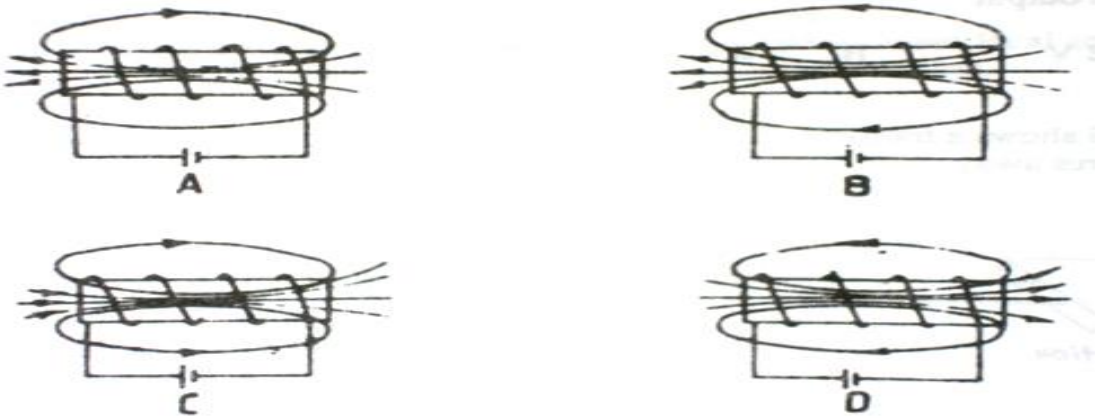
a) P, Q, R are magnets, S is magnetic
b) P and Q are magnets, S and R are magnetic.
c) P and R are magnets, Q is magnetic, S is non-magnetic.
d) P and R are magnets, Q and S are non-magnetic.

6. Which of the following statements are correct?

(i) the particles of magnetic materials are tiny magnets. (ii) the particles in un magnetised iron arrange themselves in closed chains
(iii) the particles in a magnet are arranged in open chains with N pole of one particle against the S pole of its neighbouring particle
(iv) groups of atoms form a magnetic domain

(a) (i), (ii) and (iii)only
(b) (i), (iii) and (iv) only
(c) (ii) and (iv)only
(d) (iv) only

7. Which one of the following diagrams shows a correct magnetic field due to a current flowing in a solenoid?



8. Which of the following statements are true about magnets

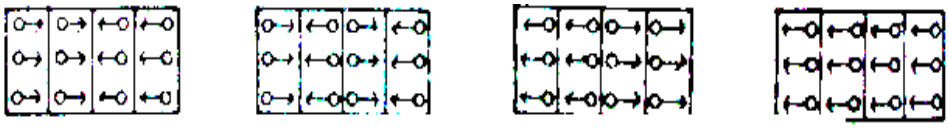
1. magnets always have opposite polarites
2. A magnet can be used as a compass
3. Repulsion is the only sure test for a magnet
4. Magnets attract all metals

A. 1 only
B. 2 and 3 only
C. 1, 2 and 3 only
D. All

9. Permanent magnets are made from

(a) diamagnetic materials
(b) Ferro magnetic materials
(c) paramagnetic materials
(d) dielectric materials

10. Which one of the following diagrams shows the correct arrangement of the magnetic domains in a magnetised material?



A B C D

11. Which of the following sentences is/are true about molecular theory of magnetism

1. Breaking a magnet into two results into the formation of two magnets
2. Heating and rough treatment destroys magnetism
3. The poles of a magnet are of equal strength
4. The lines of force travel from a north pole towards a south pole

A. 1 only
B. 1 and 3 only
C. 2 only
D. All

SECTION B

1. (a) What is a soft magnetic material?

(b) State two ways in which a bar magnet can be demagnetized.

2. a) (i) What is a magnetic field?

(ii) State the law of magnetism

3. What is a neutral point in a magnetic field?

4. **(a)** What happens when a magnet is

i) Dipped in iron filings

ii) Freely suspended in air

(b) A powerful magnet Q is placed on a soft board. Plastic pins are firmly stuck in the soft board around the magnet. An identical magnet P is held in the space surrounded by the pins above the magnet Q. When the magnet P is released, it floats above the magnet Q as shown in figure 3.

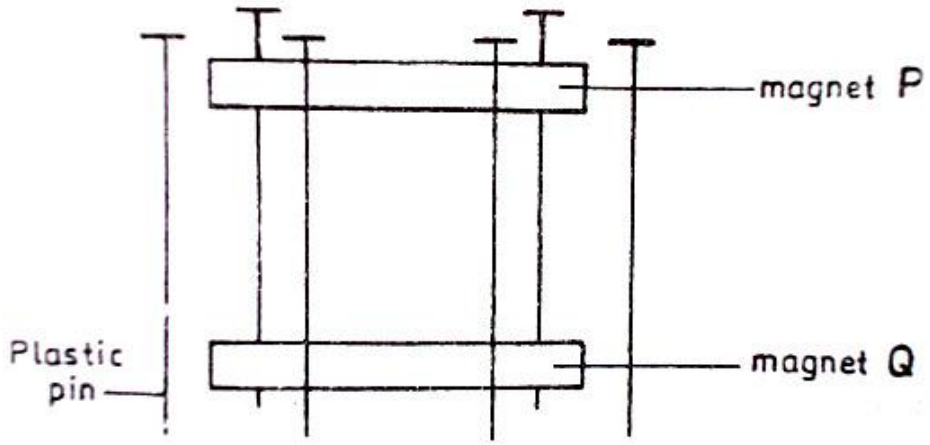


Fig.3

(i) Explain why P floats above Q.

(ii) Why are plastic pins used instead of steel pins?

(iii) What would happen to magnet P if all the pins were removed at the same time?

5. (a) What is meant by the following;

(i) Magnetic meridian

(ii) Geographic meridian

(b) Describe briefly how a steel bar may be magnetized.

6. (a) What is meant by

(i) Magnetic saturation

(ii) Demagnetisation by heating or hammering.

(b)

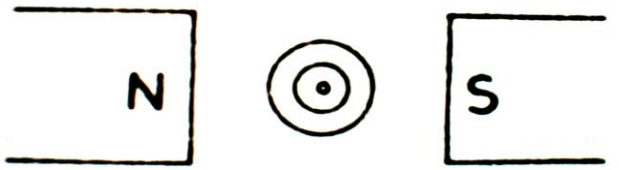


Fig. 11

An iron ring is placed between two poles of two permanent magnets as shown in the figure above. Draw the magnetic field pattern set up between the two poles.

7. (a) (i) Describe an experiment to distinguish between soft and hard magnetic materials.

(ii) State one instance in which each of these materials is used.

(b)

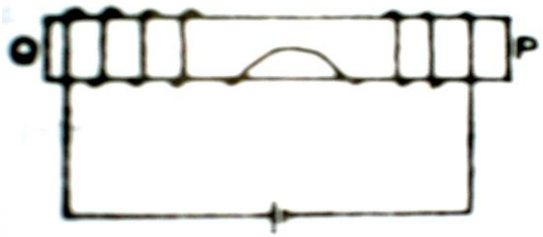


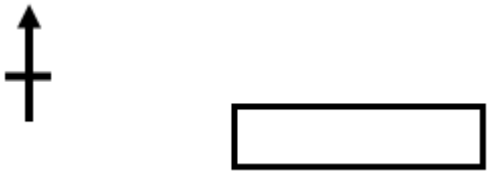
Fig. 3

The figure above shows how a magnetic material can be magnetised by electrical method

(i) Indicate the direction of current in the coil.

(ii) Name the polarities P and Q.

8. A bar magnet is placed in the earth's magnetic field with its north pole pointing to the geographical west as shown below.



(i) On the diagram, draw the lines of the resultant magnetic field around a magnet.

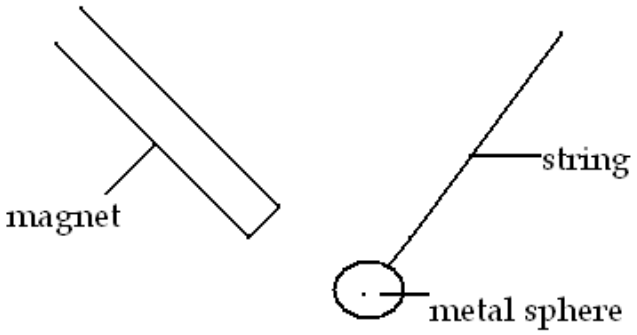
(ii) Mark the neutral point X

9. (a) Explain how a piece of iron can be magnetised by a single touch method illustrate your answer with a diagram

(b) How can you determine the polarity of a magnet?

10. With the aid of a diagram, explain the use of keepers to store magnets.

11. (a) The diagram in the figure shows a metal sphere of weight W in equilibrium. Complete the diagram to show the forces acting on the metal sphere.



(b) State two effects that a force can have on a body.

12. (a) Explain why a magnet loses its magnetism when placed in a coil of a wire carrying alternating current

(b) Describe the motion of a beam of electrons directed midway between the north and the south poles of a permanent magnet.

13. (a) Explain with the aid of diagrams how a steel bar can be magnetized by Double/divided touch method

(b) Sketch the magnetic field pattern of two bar magnets whose north poles face each other

14. **(**a) What is meant by

(i) Magnetic declination.

(ii) Angle of dip.

GROUP TEST ONE SOLUTIONS

1.B 2.D 3. D 4.B 5.C 6.B 7.D 8.C 9.B 10.D
11.D