Chapter-13, Fun with magnets

Question 1:

Fill in the blanks:

(i) Artificial magnets are made in different shapes such as _____, _____, and _____.

(ii) The materials which are attracted towards magnets are called _____.

(iii) Paper is not a _____material.

(iv) In olden days, sailors used to find direction by suspending a piece of _____.

(v) A magnet always has _____ poles.

Solution 1:

(i) Artificial magnets are made in different shapes such as _bar magnets_, __horse-shoe magnets_, and __cylindrical magnets_.

(ii) Materials which are attracted towards magnets are called magnetic materials.

(iii) Paper is not a __magnetic_ material.

Paper is not attracted by magnet. Hence, it is not a magnetic material.

(iv) In olden days, sailors used to find direction by suspending a piece of bar magnet .

A freely suspended magnet always comes to rest in the North-South direction. Hence, sailors used to find direction by suspending a piece of bar magnet.

(v) A magnet always has __two__ poles.

A magnet has two poles called the south pole (S) and the north pole (N).

Question 2: State whether the following statements are ‘True’ or ‘False’.

(i) A cylindrical magnet has only one pole.

(ii) Artificial magnets were discovered in Greece.

(iii) Similar poles of a magnet repel each other.

(iv) Maximum iron filings stick in the middle of a bar magnet when it is bought near them.

(v) Bar magnets always point towards the NorthSouth direction.

(vi) A compass can be used to find the EastWest direction at any place.

(vii) Rubber is a magnetic material.

Solution 2:

(i) False

Magnets always have two poles; the north pole and the south pole. A cylindrical magnet also has two poles.

(ii) False

Artificial magnets were not discovered in Greece. Only natural magnets were discovered in Greece.

(iii) True

Like poles of magnets repel each other, while unlike poles of magnets attract each other. The south pole of a magnet attracts the north pole of another magnet and repels the south pole of that magnet.

(iv) False

The amount of iron filings that stick to a bar magnet depends on the strength of the magnet. The magnetism of a bar magnet is maximum at its two poles and minimum in the middle. Hence, maximum iron filings will stick at the two ends of the magnet and minimum in the middle.

(v) True

A freely suspended magnet always points towards the NorthSouth direction.

(vi) True

A magnetic compass always points towards the NorthSouth direction.

If the NorthSouth direction is known, then the EastWest direction can also be determined. This direction is perpendicular to the North-South direction, i.e., perpendicular to the compass needle in the same plane.

(vii) False

Rubber is not attracted by a magnet. Hence, it is a non-magnetic material.

Question 3:

It was observed that a pencil sharpener gets attracted by both the poles of a magnet, although its body is made of plastic. Name a material that might have been used to make some part of it.

Solution 3:

The blade of a pencil sharpener is made of iron. Iron is a magnetic material. Since magnets can attract objects made of magnetic materials, a pencil sharpener gets attracted towards both poles of a magnet.

Question 4:

Column I shows different positions in which one pole of a magnet is placed near the other. Column II indicates the resulting action between them for each situation. Fill in the blanks.

Column I	**Column II**
N N	_____
N __	Attraction
S N	_____
__ S	Repulsion

Solution 4:

Like magnetic poles repel each other, while unlike magnetic poles attract each other.

Column I	Column II
N N	Repulsion
N S	Attraction
S N	Attraction
S S	Repulsion

Question 5:

Write any two properties of a magnet.

Solution 5:

Two properties of a magnet are:

(i) Magnets attract objects made of magnetic materials like iron.

(ii) Like magnetic poles repel each other, while unlike magnetic poles attract each other.

Question 6:

Where are the poles of a bar magnet located?

Solution 6:

At both ends.

The north pole (N) and the south pole (S) of a bar magnet are located at its two ends (as shown in the given figure).

Question 7:

A bar magnet has no markings to indicate its poles. How can you find out the location of the north pole?

Solution 7:

A freely suspended bar magnet always comes to rest in the NorthSouth direction. The north facing end of the magnet is its north pole, and the south facing end is its south pole (as shown in the given figure).

Hence, the unknown poles of a bar magnet can be marked by suspending it freely by a string.

Question 8:

You are given an iron strip. How will you make it into a magnet?

Solution 8:

‘Touch and stroke’ method can be used to make an iron strip into a magnet. For this, a bar magnet is required. The bar magnet is moved along the length of the iron strip starting from one end to the other end (as shown in the given figure).

Then, the bar magnet is lifted from the other end and brought to the starting point again with the same pole of the bar magnet. On repeating the process for at least 40 to 50 times, the iron strip will become a bar magnet with two poles.

Question 9:

How is a compass used to find directions?

Solution 9:

A compass always points towards the NorthSouth direction. The red arrow of the compass needle indicates its north pole. The arrow always points in the North direction (as shown in the given figure).

If we know the North direction, then we can find all the other three directions at that place. If North is towards the front, then South would be towards the back, East towards the right of North, and West towards the left of North.

Question 10:

A magnet was brought from different directions towards a toy boat that has been floating on water in a tub. The effect observed in each case is stated in Column I. Possible reasons for the observed effects are mentioned in Column II. Match the statements given in Column I with those in Column II.

S. No	Column I	Column II
1.	Boat gets attracted towards the magnet	Boat is fitted with a magnet with the nor towards its head
2.	Boat is not affected by the magnet	Boat is fitted with a magnet with the sou towards its head
3.	Boat moves towards the magnet when the north pole of the magnet is brought near its head	Boat has a small magnet fixed along its

4.	Boat moves away from the magnet when the north pole is brought near its head	Boat is made of magnetic materia
5.	Boat floats without changing its direction	Boat is made of a non-magnetic mat

Solution 10:

S. No	Column I	Column II
1.	Boat gets attracted towards the magnet	Boat is made of a magnetic material
2.	Boat is not affected by the magnet	Boat is made of a non-magnetic material
3.	Boat moves towards the magnet when the north pole of the magnet is brought near its head	Boat is fitted with a magnet with the south pole towards its head
4.	Boat moves away from the magnet when the north pole is brought near its head	Boat is fitted with a magnet with the north pole towards its head
5.	Boat floats without changing its direction	Boat has a small magnet fixed along its length

1. Magnetic materials get attracted towards a magnet.

2. Non-magnetic materials do not get attracted towards a magnet.

3. Unlike poles of magnets attract each other.

4. Like poles of magnets repel each other.

5. Magnets always point towards the North-South direction.