Exploring Magnets

Standard difficulty · 20 questions · 40 marks · Time: 36 minutes

Name: _____ Date: _____ Score: ____ / 40

Show your working for Sections B and C. Answers are on the last page — try every question first!

Section A — Choose the correct answer — 8 × 1 = 8 marks

1. A natural magnet found in rocks is called:
(a) marble **(b)** sandstone **(c)** limestone **(d)** lodestone

2. Which of these is attracted by a magnet?
(a) a steel spoon **(b)** aluminium foil
(c) a cotton thread **(d)** a copper wire

3. Which of these is NOT attracted by a magnet?
(a) iron filings **(b)** a steel spoon
(c) a steel paper clip **(d)** a cotton thread

4. What happens when you bring a north pole near a north pole?
(a) they spin round and round **(b)** they attract
(c) they repel **(d)** nothing happens

5. Kabir's compass shows he is facing south. Which direction is on his right?
(a) west **(b)** south **(c)** north **(d)** east

6. A bar magnet is broken into 14 pieces. How many poles are there in all?
(a) 15 poles **(b)** 14 poles **(c)** 2 poles **(d)** 28 poles

7. The end of a bar magnet picked up 7 pins and its middle picked up 1. How many times as many pins did the end pick up?
(a) 1 **(b)** 7 **(c)** 6 **(d)** 8

8. Bar magnets are stored in pairs, with two keepers for each pair. How many keepers are needed for 44 bar magnets?
(a) 46 **(b)** 22 **(c)** 44 **(d)** 88

Section B — Short answer — 8 × 2 = 16 marks

9. What are magnetic and non-magnetic materials? Give one example of each.

10. Write "magnetic" or "non-magnetic": (a) the blades of steel scissors (b) a wooden pencil

11. Do they "attract" or "repel"? (a) a south pole near a north pole (b) a north pole near a north pole

12. You stand at a bus stop facing west. Which directions are on your (a) right (b) left?

13. How is a magnet used in each, and what property does it use? (a) a toy train hook (b) a pencil box lid

14. A box has 9 bar magnets and 18 iron nails. 2 magnets are taken out. How many poles are left in the box?

15. One end of a magnet picked up 28 pins, the other end 29 pins and the middle only 4. Where is the magnet's pull strongest?

16. A science kit has 6 bar magnets at ₹63 each and a compass at ₹83. What is the total cost?

Section C — Word problems — 4 × 4 = 16 marks

17. Describe an activity to show that a magnet's pull is strongest at its poles.

18. A bar magnet is broken into 15 pieces. (a) How many north poles are there now? (b) How many poles in all? (c) Explain why you can never get a magnet with only one pole.

19. Sort these into magnetic and non-magnetic: aluminium foil, a steel paper clip, an iron nail, a copper wire, a wooden pencil, iron filings. How could a magnet help you clean up if they were mixed with sand?

20. Raju starts facing west, walks 14 steps, turns to his right and walks 14 more steps, then turns right again. (a) Which way is he facing now? (b) How many steps did he walk? (c) How could a compass help him?

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Answer key

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Q	Answer	Working
1	**(d) lodestone**	—
2	**(a) a steel spoon**	—
3	**(d) a cotton thread**	—
4	**(c) they repel**	like poles repel, unlike poles attract
5	**(a) west**	—
6	**(d) 28 poles**	each piece has 2 poles: 14 × 2 = 28
7	**(b) 7**	7 ÷ 1 = 7
8	**(c) 44**	44 magnets = 22 pairs; × 2 keepers
9	**Magnetic materials are attracted by a magnet (iron); non-magnetic ones are not (wood).**	—
10	**(a) magnetic (b) non-magnetic**	—
11	**(a) attract (b) repel**	—
12	**(a) north (b) south**	—
13	**(a) magnets join the carriages (b) a magnet holds the steel lid shut**	—
14	**14 poles**	7 magnets × 2 = 14 (nails have no poles)
15	**at the two ends (the poles)**	—
16	**₹461**	6 × 63 + 83
17	**Spread iron filings on paper and roll a bar magnet in them. Most filings stick at the two ends and very few in the middle, showing the pull is strongest at the poles.**	—
18	**(a) 15 (b) 30 (c) Every piece becomes a complete magnet with a north and a south pole; poles always come in pairs.**	—
19	**Magnetic: a steel paper clip, an iron nail, iron filings. Non-magnetic: aluminium foil, a copper wire, a wooden pencil. Move a magnet through the sand: the magnetic objects stick to it.**	—
20	**(a) east (b) 28 steps (c) Its needle always points north–south, so he can always find the directions.**	—