

Sul Rae

Physical Science Sec IV
Magnetism
Test

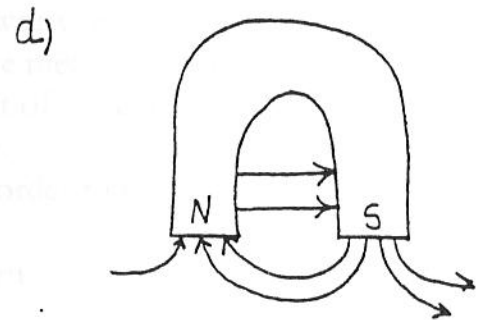
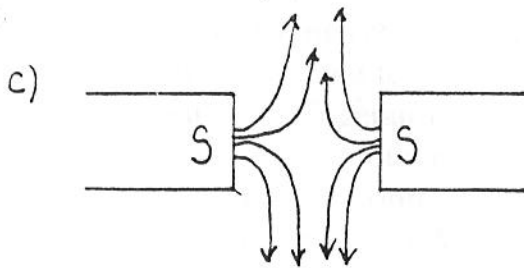
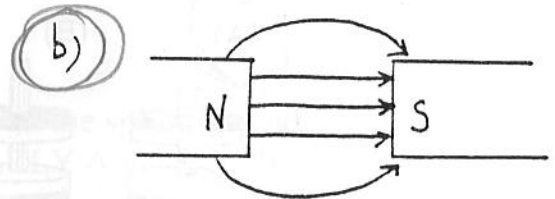
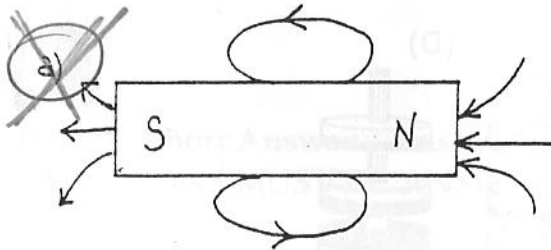
Name: Answer Sheet

Part A: Multiple Choice – Circle the correct answer. [10 marks]

1. Which statement concerning field lines is **TRUE**?

- a) The field lines form loops at each of the poles of a bar magnet.
- b) The field lines leave the North pole and enter the South pole.
- c) The field lines represent the path that the South pole of a compass will take when placed in the magnetic field.
- d) The field lines leave the South pole and enter the North pole.

2. Which of the following diagrams is correct?



3. In the laboratory you are given three different substances:

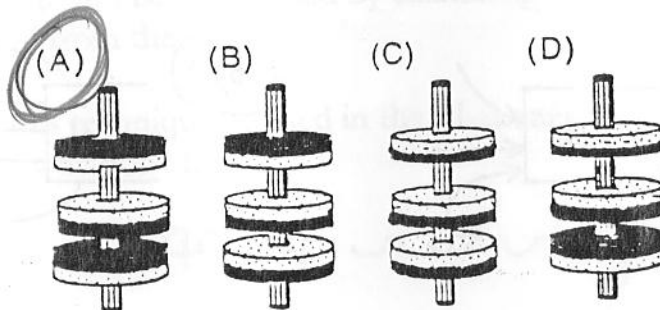
1. a magnet
2. a ferromagnetic substance
3. a non-magnetic substance

You bring these three substances close to one another and you note your observations.

Which of the observations below is CORRECT?

- a) Substances 1 and 2 ~~repel~~ each other.
- b) Substances 1 and 2 attract each other.
- c) Substances 1 and 3 attract each other.
- d) Substances 2 and 3 attract each other.

4. Three ring magnets are placed over each other. Which diagram represents the interaction of the magnetic fields correctly?



5. You have two ten-cent coins, one from 1965 and the other from 1994. To determine whether these coins are magnetic, ferromagnetic or non-magnetic, you conduct tests and note your observations.

Step #	Test	Observation
1	Bring a magnet near the 1965 coin.	No reaction
2	Bring a magnet near the 1994 coin.	Attraction
3	Bring each coin near an iron nail.	No reaction

Given these observations, what can be said about these coins?

- a) The 1965 coin is non-magnetic and the 1994 coin is magnetic.
 b) The 1965 coin is non-magnetic and the 1994 coin is ferromagnetic.
 c) The 1965 coin is magnetic and the 1994 coin is ferromagnetic.
 d) The 1965 coin is ferromagnetic and the 1994 coin is magnetic.

Part B: Short Answer – Answer all questions in the spaces provided.
 QUESTIONS MUST BE ANSWERED NEATLY AND LOGICALLY.

1. Which of the following are magnetic phenomenon? b, c, e, f [2]

- a. Dust sticks to the screen of a computer monitor.
 b. A screw is attracted to the blade of a screwdriver.
 c. The seal of a refrigerator door sticks to the metal of the refrigerator.
 d. Socks stick to each other as they come out of the dryer.
 e. Songs are recorded onto an audio cassette.
 f. A debit card used at an ATM machine in order to withdraw a sum of money.
 g. Lightning formation during a thunderstorm.

2. What does each of the following define? [4]

- a. A substance that is not attracted nor repelled by a magnet.

non-magnet

- b. A substance that becomes magnetic in the presence of a magnet but loses its magnetism when removed from the magnet.

ferro "soft" (don't have

- c. Substances that become strongly magnetic in the presence of a magnet and maintain some of their magnetism after being removed from the magnet.

ferro "hard"

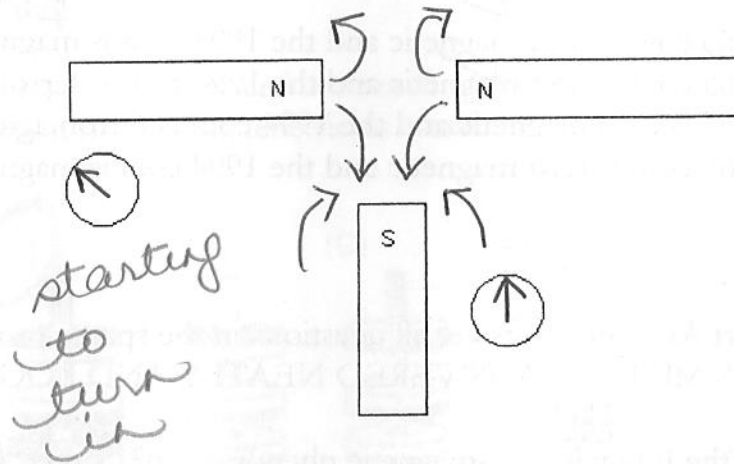
to know soft + hard

- d. Substances that exhibit magnetic properties on their own.

magnet

3. A) Draw the magnetic field lines present between the three magnets. [3]

- B) Indicate the direction of the compass needle in each situation. [2]



4. Explain what happens to the internal structure of an iron nail when the NORTH pole of a magnet approaches the pointy tip of the nail. You may use a diagram TO HELP in your explanation. [4]



the S poles of the domains line up facing the N pole of the magnet

5. Describe the procedures taken to distinguish between a magnet and a ferromagnetic substance? [3]

mag + mag = att + rep

mag + ferro = always att

iron filings = pattern around mag

6. True or False? If a statement is FALSE, add or change a word to make it true. [5] *Not all*

F a. ~~All~~ metals are ferromagnetic.

F b. A magnet can be used to repel a ferromagnetic substance that was not initially magnetized.

T c. Lines of force always exit the north pole of a magnet and enter the south pole.

F d. Non-magnetic substances are *not* made up of domains.

T e. The magnetic field around the poles of a magnet is strongest.

7. If you were given a magnet sealed in a small box, what could you do to determine its shape? Explain clearly. [2]

iron filings!
compasses!

8. You are travelling all the way to the WEST ISLAND with Lindsay and find that your Spice Girl cassettes have been rolling all over the floor throughout the ride.

What has happened to the quality of the cassettes? Why? Explain clearly.

- [3]
- 1) ↓ quality bec cassette tapes have domains lined up a certain way.
 - 2) de-alignment of the domains
 - 3) can't hear the sound as well
 - 4)

9. Automobile mechanics sometimes use a magnet to detect iron filings (resulting from significant wear and tear of the engine's internal parts) in the oil at the bottom of the engine crankcase. A magnet attached to a string is placed in the oil, and all the metal particles stick to it. The amount of damage can be determined by examining the magnet once it has been removed from the oil.

Could this technique be used in the all-aluminum engine of a Porsche? Why or why not? [2]

No. Al is not magnetic or ferromag
∴ putting a magnet near the engine will not attract Al filings