ST-4
Practice

Name:

More Magnetism

1. Which substances below are magnetic?
   a) aluminium, copper, iron
   b) magnet, magnetite, compass needle
   c) rubber, glass, plastic
   d) gold, silver, copper

2. Which of the following substances will attract a paperclip? *
   a) iron nail
   b) magnet
   c) nickel coin
   d) aluminum tab

   enriched
   * ferromagnetic

3. Which of the following objects would not be attracted to a magnet?
   a) a compass needle
   b) a piece of magnesium
   c) a quarter
   d) an iron nail

   Fe, Ni, Co

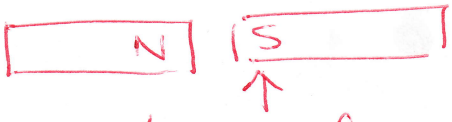
4. Which of the following objects work according to magnetic principles?
   1. Light bulb
   2. Medical Scanning equipment
   3. Automatic banking card
   4. Toaster

   a) 1 and 2
   b) 1 and 4
   c) 2 and 3
   d) 3 and 4

5. According to the theory of magnetism, a material is magnetic because
   a) it does not contain particles called domains
   b) its domains are all aligned in the same direction
   c) its domains are more densely packed than non-magnetic materials
   d) its domains are randomly scattered throughout

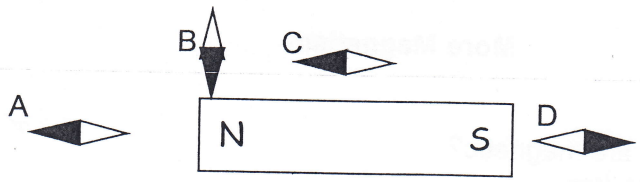
6. Iron has a low magnetic remanence/retentivity because
   a) it does not have domains
   b) its domains align and disalign easily
   c) its domains do not align and disalign easily
   d) its domains never align

7. When a bar magnet hangs freely in the air, it aligns itself so that the North pole of the magnet will point towards geographic
   a) east
   b) north
   c) south
   d) west



attrac. to South magn.
= North Geographic

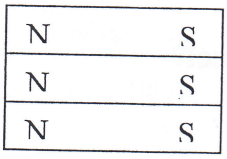
8. Which of the following shows the correct orientation of a compass needle placed next to a bar magnet?



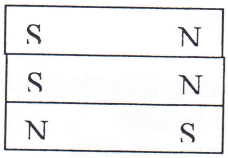
a) A
b) B
c) C
d) D

9. Which of the following diagrams correctly shows the placement of bar magnets if they were placed adjacent to one another?

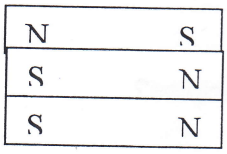
a)



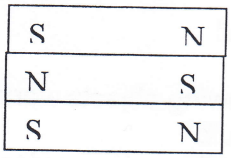
b)



c)

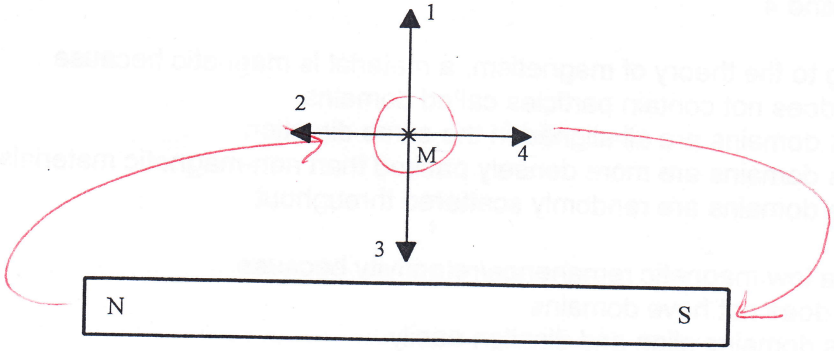


d)



10. Given a point M in the magnetic field surrounding a bar magnet.

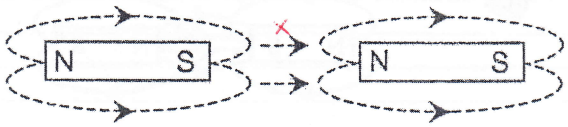
Of the four arrows shown below, which one correctly shows the magnetic force which would act on a point charge at point M?



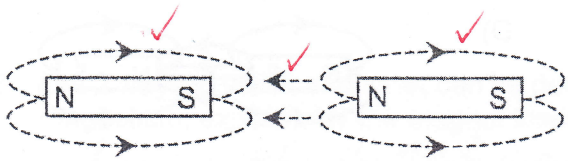
a) 1
b) 2
c) 3
d) 4

11. Two identical magnets are placed next to each other.
Which of the following diagrams best represents the magnetic field between the two magnets?

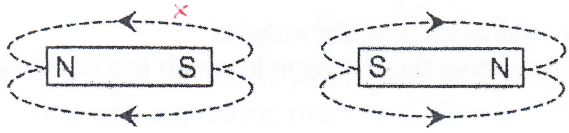
A)



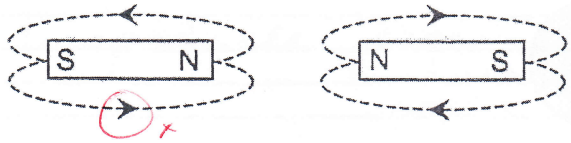
B)



C)

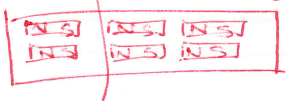


D)



12. A magnet creates what is known as a magnetic field. A compass can be used to show the magnetic field.
Which of the following statements are true?

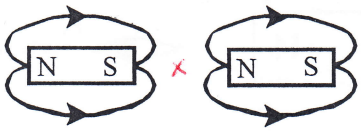
1. If a bar magnet is broken in two, each piece will only have one magnetic pole.
2. Like poles repel each other.
3. The needle of a compass is a small magnet.
4. Aluminum can be easily magnetized.



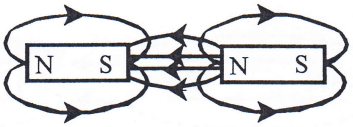
A) 1 and 2
B) 1 and 4
C) 2 and 3
D) 3 and 4

13. Two magnets are placed end to end.
Which diagram best illustrates the magnetic fields surrounding these magnets?

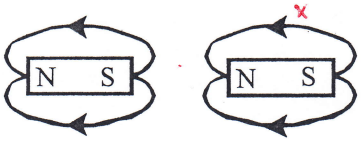
A)



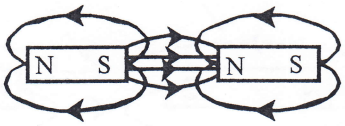
C)



B)

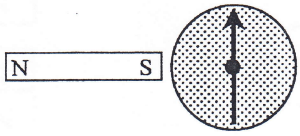


D)

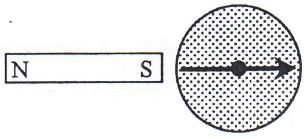


14. A magnetic compass is placed at one of the ends of a bar magnet.
Which of the following diagrams correctly shows the direction in which the compass needle will point?

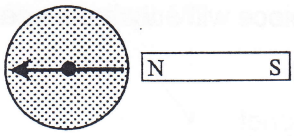
A)



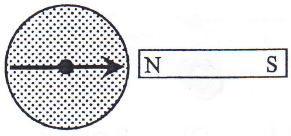
B)



C)



D)



20. You have a magnet and three other objects. You want to find out if one of the objects is also a magnet. How would you do this?

the magnet will (1) be attracted to the magnet
and
(2) be repelled by the magnet

21. List 2 ways in which a magnet can be demagnetized or weakened. Using the theory of magnetism, explain why the magnet loses its magnetic properties.

domains disalign ∴ no longer magnetic
1- banging + hitting
2- heating

22. During a lab exam, Audrey arrives at her lab station to discover a sealed cardboard box with a question mark on it. She is told that in the box are 2 bar magnets. What must she do to determine the position and polarities of the bar magnets?

1. sprinkle iron filings on the box
→ shape of the magnetic fields will appear

2. use a compass above the poles of the magnet
→ red needle will point to the South pole

23. In a steel mill, a mechanical crane with a powerful electromagnet suspended from the end of a cable is used to load and unload pieces of iron of all shapes and sizes. Indicate 2 reasons why an electromagnet is used rather than a natural magnet.

→ stronger
→ can be turned on + off

24. Automobile mechanics sometimes use magnets to detect iron filings in the oil at the bottom of the engine. The pieces of iron fall into the engine from the wear and tear of the engine's internal parts. A magnet is attached to a string and placed in the oil. All the iron pieces that fell into the engine adhere to it and are removed. 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-aluminium engine of a Porsche? Why or why not?

NO - aluminum engine will break (wear/tear) & pieces of Al

↓ these are non-magnetic

∴ technique cannot be used

(magnets can't "pick up" alum.)