

**Physics 3204**  
*Unit 2: Electromagnetism*  
**Worksheet 1: Magnets and Their Properties**

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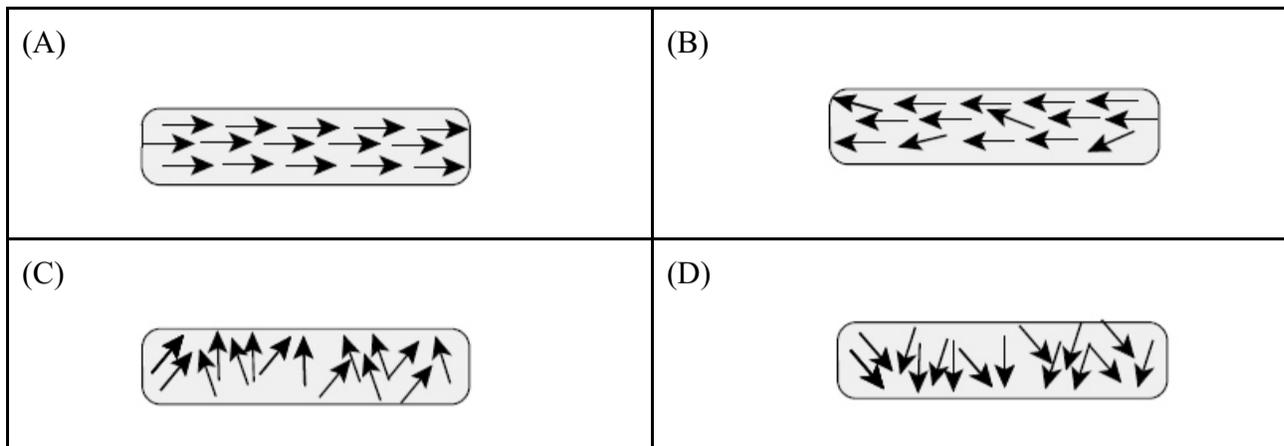


**PART A: MULTIPLE CHOICE**

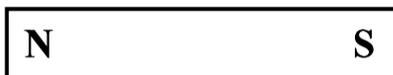
1. Which of the following rocks is called a natural magnet?
  - (A) Lodestone
  - (B) Obsidian
  - (C) Pyrite
  - (D) Quartzite
  
2. What is the basic source of magnetism?
  - (A) Charged particles alone
  - (B) Movement of charged particles
  - (C) Magnetic dipoles
  - (D) Magnetic domains
  
3. Which best describes a magnetic Domain
  - (A) the magnetic field around a magnetic
  - (B) an atom that acts as a tiny magnet
  - (C) a group of atoms with their magnetic axis lined up in the same direction
  - (D) a metal that can be magnetized by induction
  
4. Which of the following describes the domains of an unmagnetized piece of iron?
  - (A) empty
  - (B) perpendicular to each other
  - (C) pointing in random directions
  - (D) pointing in the same direction
  
5. What substance is attracted to a magnet?
  - (A) silver
  - (B) lead
  - (C) water
  - (D) iron
  
6. What characteristics do magnetic substances have?
  - (A) They can give a “shock” when you touch them.
  - (B) They can push or pull objects they are not touching.
  - (C) They are always black and cold to touch.
  - (D) They fall faster than other objects when you drop them.
  
7. What happens when two north poles of magnets are placed together?
  - (A) They repel.
  - (B) They attract.
  - (C) They cancel each other out.
  - (D) The strength of the magnet is doubled.
  
8. Which of the following is diamagnetic?
  - (A) aluminum
  - (B) iron
  - (C) nickel
  - (D) silver

9. Which of the following is paramagnetic?
- (A) aluminum
  - (B) copper
  - (C) iron
  - (D) nickel
10. Which statement about the magnetic North Pole of the Earth is true?
- (A) Its location never changes
  - (B) It corresponds to the N-pole of a bar magnet
  - (C) It corresponds to the S-pole of a bar magnet
  - (D) It is at the same location as the geographic north pole of earth
11. Which of the following is true about magnetic field lines( $\vec{B}$ )?
- (A) show the strength of the magnetic field
  - (B) show the direction of the magnetic field
  - (C) become more widely spaced as the magnetic force weakens
  - (D) all the above are correct
12. Which is used to determine the direction of magnetic field lines around a bar magnet?
- (A) north magnetic pole
  - (B) south magnetic pole
  - (C) positively charged particle
  - (D) negatively charged particle
13. The circle between the ends of a horseshoe magnet shown below represents a compass. If the pole on the left is the North pole, which direction will the needle of the compass point?
- 
- (A) to the left
  - (B) to the right
  - (C) up
  - (D) down
14. A bar magnet is placed on a flat surface, with its North pole on the right side. If a compass is placed near the North pole, which direction will the needle of the compass point?
- (A) to the left
  - (B) to the right
  - (C) up
  - (D) down
15. Which is a similarity between Earth's magnetic and gravitational fields?
- (A) Field lines point only away from Earth.
  - (B) Field lines point only toward Earth.
  - (C) Field strength is dependent on distance from Earth.
  - (D) Field strength is independent of distance from Earth.
16. How does a ferromagnetic substance act in the presence of a magnetic field?
- (A) strongly attracted
  - (B) strongly repelled
  - (C) weakly attracted
  - (D) weakly repelled

17. Which is the strongest magnet?

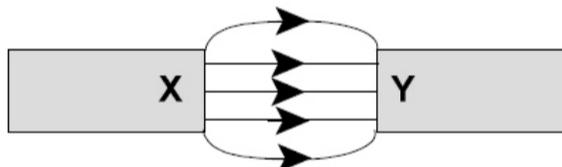


18. If the magnet below was broken, what would be the polarity at the break point?



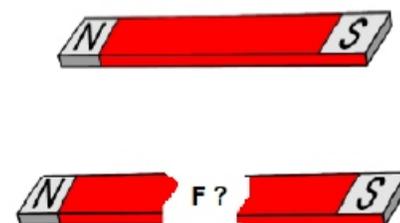
- (A) 
- (B) 
- (C) 
- (D) 

19. What is the polarity of X and Y for the magnets shown below?



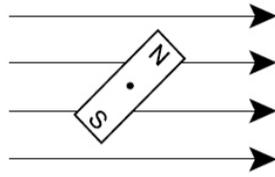
	X	Y
(A)	North	North
(B)	North	South
(C)	South	North
(D)	South	South

20. A bar magnet is divided in two pieces. Which of the following statements is true about the force between the broken pieces if they face each other with a small separation?



- (A) There is an electric repulsive force between the broken pieces.
- (B) There is an electric attractive force between the broken pieces.
- (C) There is a magnetic repulsive force between the broken pieces.
- (D) There is a magnetic attractive force between the broken pieces.

21. Which shows the final position of a bar magnet that is free to rotate in a magnetic field and is initially positioned as shown below?



<p>(A)</p> <p>A diagram showing a bar magnet oriented horizontally with its 'S' pole on the left and 'N' pole on the right. The magnetic field lines are horizontal and point to the right.</p>	<p>(B)</p> <p>A diagram showing a bar magnet oriented vertically with its 'N' pole at the top and 'S' pole at the bottom. The magnetic field lines are horizontal and point to the right.</p>
<p>(C)</p> <p>A diagram showing a bar magnet oriented horizontally with its 'N' pole on the left and 'S' pole on the right. The magnetic field lines are horizontal and point to the right.</p>	<p>(D)</p> <p>A diagram showing a bar magnet oriented vertically with its 'S' pole at the top and 'N' pole at the bottom. The magnetic field lines are horizontal and point to the right.</p>

22. Which best represents the magnetic field around a bar magnet?

<p>(A)</p> <p>A diagram showing a bar magnet with 'N' on the left and 'S' on the right. Magnetic field lines are shown as closed loops that exit from the 'N' pole and enter the 'S' pole.</p>	<p>(B)</p> <p>A diagram showing a bar magnet with 'N' on the left and 'S' on the right. Magnetic field lines are shown as closed loops that enter the 'N' pole and exit the 'S' pole.</p>
<p>(C)</p> <p>A diagram showing a bar magnet with 'N' on the left and 'S' on the right. Magnetic field lines are shown as closed loops that enter the 'N' pole and exit the 'S' pole.</p>	<p>(D)</p> <p>A diagram showing a bar magnet with 'N' on the left and 'S' on the right. Magnetic field lines are shown as closed loops that exit from the 'N' pole and enter the 'S' pole.</p>