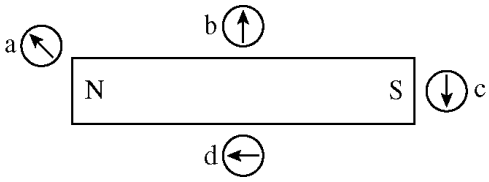
PRACTICE MAGNETISM 1

1. Where is the magnitude of the magnetic field around a permanent magnet greatest?
   a. close to the poles
   b. far from the poles
   c. The magnitude is equal at all points on the field.
   d. The magnitude depends on the material of the magnet.

2. Which compass needle orientation in the figure might correctly describe the magnet's field at that point?
   a. a b. b c. c

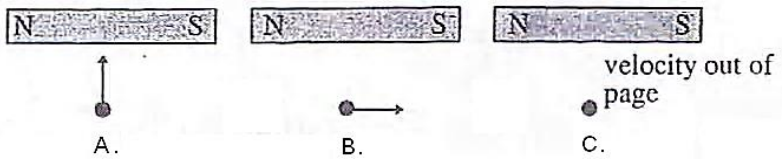


3. If a proton is released at the equator and falls toward Earth under the influence of gravity, the magnetic force on the proton will be toward the
   a. north.
   b. south.
   c. east.
   d. west.

4. What is the path of an electron moving perpendicular to a uniform magnetic field?
   a. a straight line b. a circle c. an ellipse d. a parabola

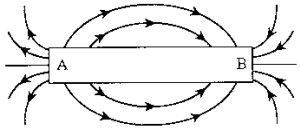
5. What is the path of an electron moving parallel to a uniform magnetic field?
   a. straight line b. circle c. ellipse d. parabola

6. A proton moves past a bar magnet as shown. Find the direction of the force it experiences in each case.

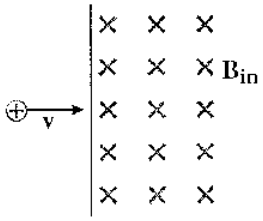


7. An electron is moving with a speed of 3.0×10^5 ms^{-1} in a direction that is at right angles to a uniform magnetic field of 3.0×10^{-3} T. Calculate
   a. the force exerted on the electron.
   b. the radius of the path of the electron.

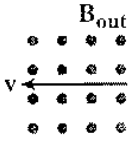
9. The magnetic field of a bar magnet is shown in the figure.
   Is the magnet's north pole at A or B?



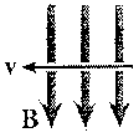
10. Find the direction of the force on an proton moving through the magnetic field shown.



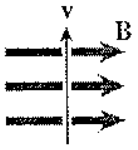
11. Find the direction of the force on an proton moving through the magnetic field shown.



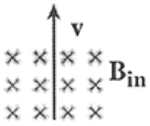
12. Find the direction of the force on an electron moving through the magnetic field shown.



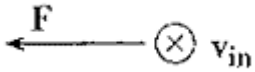
13. Find the direction of the force on an electron moving through the magnetic field shown.



14. Find the direction of the force on an electron moving through the magnetic field shown.



15. A negative charge is moving through a magnetic field. The direction of motion and the direction of the force acting on it at one moment are shown in the figure. Find the direction of the magnetic field.



16. A negative charge is moving through a magnetic field. The direction of motion and the direction of the force acting on it at one moment are shown in the figure. Find the direction of the magnetic field.

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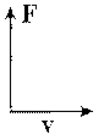
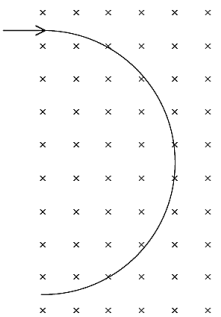


18. An electron moves north at a velocity of 9.8×10^4 m/s and has a magnetic force of 5.6×10^{-18} N exerted on it. If the magnetic field points upward, what is the magnitude of the magnetic field?

19. An electron moves north at a velocity of 2.7×10^4 m/s and has a magnetic force of 9.5×10^{-18} N exerted on it. If the magnetic field points upward, what is the magnitude of the magnetic field?

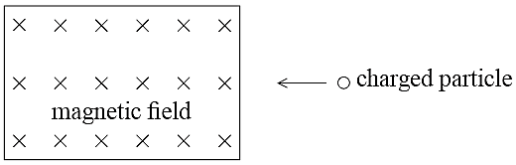
20. A charged partide is injected into a region of uniform magnetic field and travels in a circular arc.



If the particle were to be injected with a **greater speed**, what would be true of the magnetic force on it and the radius of its path?

	Force	**Arc radius**
A.	greater	greater
B.	greater	smaller
C.	smaller	greater
D.	smaller	smaller

12. The diagram below shows a charged particle about to enter a region of uniform magnetic field directed into the page.



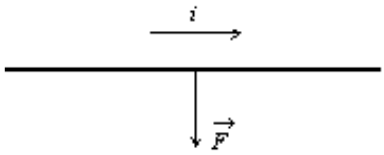
Which of the following correctly describes the change, if any, in the kinetic energy and the momentum of the particle in the magnetic field?

	Kinetic energy	Momentum
A.	Changed	Changed
B.	Changed	Unchanged
C.	Unchanged	Changed
D.	Unchanged	Unchanged

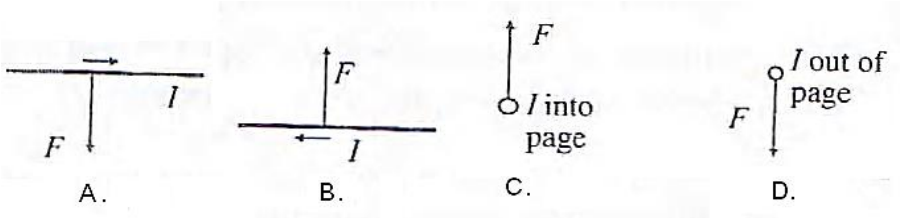
22. A charged partide of mass *m* and charge *q* is travelling in a uniform magnetic field with speed *v* such that the magnetic force on the particle is *F*. The magnetic force on a particle of mass 2*m*, charge *q* and speed 2*v* travelling in the same direction in the magnetic field is

A. 4*F*.
B. 2*F*.
C. *F*.
D. ½ *F*.

23. The diagram show a straight wire carrying current i in a uniform magnetic field. The magnetic force on the wire is indicated by an arrow but the magnetic field is not shown. Of the following possibilities, the direction of the magnetic field is:



24. What is the direction of a magnetic field in each of the four cases that results in a force on the current as shown?



25. A wire that is carrying a current of 3.50 A east has 2.00 m of its length in a uniform magnetic field of magnetic flux density of 5.00×10^{-7} T directed vertically into the paper.
Determine the magnitude and direction of the force it experiences.

MAGNETISM PRACTICE II

1. A bar magnet is placed in a uniform magnetic field as shown.
(a) Is there a net force on the bar magnet?
(b) Will it move? If so, how?