MAGNETISM PRACTICE I

1. A 2. A 3. C 4. B 5. A

6. A. into the page B. F = 0 C. south

7. *a.* **F** = *q***v B** = *(1.6 x 10^{-19} C) x (* 3.0 x10^{5} ms^{-1}) x (3.0 x 10^{-3} T) = 1.44 x 10^{-16} N
at right angles to the magnetic field and the path of its motion.
b. $\mathbf{F}_{mag}$ = *q***v B** $\mathbf{F}_{cp}$ = *m***v**^{2} */ r.*
*q***v B** = *m***v**^{2} */ r* *q* **B** = *m***v** */ r* *r* = *m***v** */ q* **B**
r = [(9.11 x 10^{-31}) x (3.0 x 10^{5} ms^{-1})]/[(1.6 x 10^{-19} C) x (3.0 x 10^{-3} T)]
r = 5.69 x 10^{-4} m

8. no, $\sin 0^0 = 0$

9. A

10. down, toward the bottom of the page

11. up, toward the top of the page

12. into the page.

13. out of the page

14. to the right

15. up, toward the top of the page

16. to the left

17. out of the page

18. 3.6×10^{-4} T

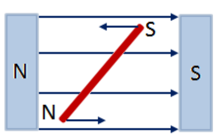
19. 2.2×10^{-3} T

20. A 21. C 22. B 23. out of the page

24. A. out of the page B. out of the page C. west D. east

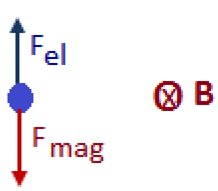
25. **F** = *I l* **B** = *(3.5 A) x (2.00 m) x (*5.00 x 10^{-7} T *) = 3.50 x 10^{-6} N.*

MAGNETISM PRACTICE II

1. 

(a) net force on the magnet is zero
(b) there is a pair of forces which will produce rotation

2. *A. B into the page B. F into the page C. B out of the page D F = 0 E. F = 0*

3. 

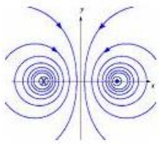
(a) B must be into page. $F_{mag} = F_{el}$ qvB = qE B = E/v E = V/d = 2400 V/m B = 0.012 T
(b) proton would have both electric and magnetic force in opposite direction, so yes.
(c) Doubling the speed would result in halfing the magnetic field, but not changing electric force, so electron would be deflected toward upper plate.

4. **F** = *I l* **B** = *(3.5 A) x (2.00 m) x (*5.00 x 10^{-7} T *) = 3.50 x 10^{-6} N.*

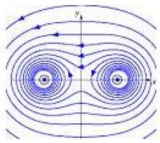
5. *a.* **F** = *q***v B** = *(1.6 x 10^{-19} C) x (* 3.0 x10^{5} ms^{-1}) x (3.0 x 10^{-3} T) = 1.44 x 10^{-16} N
at right angles to the magnetic field and the path of its motion.
b. $\mathbf{F}_{mag}$ = *q***v B** $\mathbf{F}_{cp}$ = *m***v**^{2} */ r.* *q***v B** = *m***v**^{2} */ r* *q* **B** = *m***v** */ r* *r* = *m***v** */ q* **B**

$r = [(9.11 \times 10^{-31}) \times (3.0 \times 10^{5}\ ms^{-1})]/[(1.6 \times 10^{-19}\ C) \times (3.0 \times 10^{-3}\ T)]$ *$r = 5.69 \times 10^{-4}\ m$*

6.

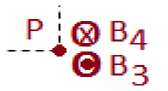


A.



B.

7. vector sum of two fields



$B = (\mu_0/2\pi)I/d$ $B_4 = 1.1 \times 10^{-5}$ T $B_3 = 0.6 \times 10^{-5}$ T $B_{net} = 0.5 \times 10^{-5}$ T into the page

8. no, $\sin 0^0 = 0$

9. P: out of page   Q: into page

10. B. ***B*** = ***F / IL*** = kg m s-2 / A m

11. C   14. B   15. C   16. C

17. inside the loop is out of the paper; outside the loop is into the paper

18. A

19. A. south   B. west

20. no, $\sin 0^0 = 0$

21. 10   22. D   23. D   24. C 25. A