

Ch 22 HW

- 1) a. left b. away from me c. up
d. none e. right f. down

- 2) a. right b. towards me c. down
d. none e. left f. up

- 5) a. away from me b. left c. towards me

- 6) a. towards me b. right c. away from me

11) a. $F = qvB$
 $q = \frac{F}{vB}$
 b.

$$q = \frac{1.00 \times 10^{-12}}{30.0 (5.0 \times 10^{-9})}$$

$$q = 6.67 \times 10^{-10} \text{ C}$$

12) $\frac{mv^2}{r} = qvB$
 $r = \frac{mv}{qB}$

$$r = \frac{(9.1 \times 10^{-31})(7.5 \times 10^6)}{(1.6 \times 10^{-19})(1.00 \times 10^{-5})}$$

$$r = 4.27 \text{ m}$$

15) a. $\frac{mv^2}{r} = qvB$
 $q = \frac{mv}{rB}$
 b. $\frac{4.80 \times 10^{-14}}{1.6 \times 10^{-19}} = 3$

$$q = \frac{(2.66 \times 10^{-26})(5.00 \times 10^6)}{(.231)(1.20)}$$

$$q = 4.80 \times 10^{-19}$$

20) $\frac{mv^2}{r} = qvB$
 $r = \frac{mv}{qB}$

$$r_1 = \frac{(2.66 \times 10^{-26})(5.00 \times 10^6)}{(1.6 \times 10^{-19})(1.20)}$$

$$r_1 = .693 \text{ m}$$

$$r_2 = \frac{(2.4425 \times 10^{-26})(5.00 \times 10^6)}{(1.6 \times 10^{-19})(1.20)}$$

$$r_2 = .779 \text{ m}$$

$$2(.779) - 2(.693) = d_{\text{tot}}$$

$$.172 \text{ m} = d_{\text{tot}}$$

- 33) a. away from me b. left c. towards me

39) a. $F = I l B \sin \theta$

$$24.0 = (8.00)(.50)(1.20) \sin \theta$$

$$.5 = \sin \theta$$

$$\theta = 30^\circ$$

b. $F = (8.00)(.50)(1.20) \sin(90)$

$$F = 4.8 \text{ N}$$