Ch 11 homework solutions

15) a) left b) into page c) up page d) none e) right f) dow

19) a) into page b) left c) out of page

26) a) $qvB = mv^2/R \Rightarrow B = \frac{mv}{qR} = \boxed{0.261\ T}$

b) FSU National High Magnetic Field Lab has 10 Tesla magnets

32) $\Delta k = q\Delta V = \frac{1}{2}mv_f^2 \Rightarrow v_f = \boxed{\sqrt{\frac{2q\Delta V}{m}}}$

also, $R = \frac{mv}{qB} = \frac{m}{qB}\sqrt{\frac{2q\Delta V}{m}} = \boxed{\frac{1}{B}\sqrt{\frac{2m\Delta V}{q}}}$

33) a) left b) into page c) up d) none e) right f) down

35) a) into page b) left c) out of page

40) a) $\tau_{max} = \vec{\mu} \times \vec{B}_{max} = NAIB = \boxed{389\ N\cdot m}$

b) $\tau_{max}\sin(10.9) = \boxed{73.5\ N\cdot m}$

44) a) $\sin\theta = 0.9 \Rightarrow \theta = \sin^{-1}(0.9) = \boxed{64.2^\circ}$

b) $\theta = \sin^{-1}(0.5) \Rightarrow \boxed{\theta = 30.0^\circ}$

c) $\theta = \sin^{-1}(0.1) \Rightarrow \boxed{\theta = 5.7^\circ}$

54) $qE = qvB_1 \Rightarrow v = E/B_1$ and $B_2 = \frac{mv}{qR} \Rightarrow m = \frac{qB_2R}{v} = \frac{qB_2R}{E/B_1}$

$\Rightarrow \boxed{m = 1.161 \times 10^{-26}\ kg}$

75) $\frac{R_A}{R_B} = \frac{m_a v_a / q_A B}{m_B v_B / q_B B} = q_B/q_A = \boxed{\frac{1}{4}}$