Physics 231 – 3rd hour exam – 07 Nov 2007

PUT YOUR NAME AND STUDENT NUMBER ON EACH PAGE!

EXPLAIN YOUR REASONING AND SHOW YOUR WORK.

To receive full credit or significant partial credit, you must clearly explain your reasoning. Any sketches must clearly indicate the direction with respect to the positions in the figure (i.e. is it parallel to something or is it a particular angle with respect an axis, etc.).

Potentially Useful Equations:

In order to get partial credit
You must explain why you select a particular equation

\[ \tau = IBA \sin \varphi \]
\[ \vec{\tau} = \vec{\mu} \times \vec{B} \]
\[ \vec{F} = \vec{I} \times \vec{B} \]
\[ d\vec{F} = I d\vec{l} \times \vec{B} \]
\[ d\vec{B} = \frac{\mu_0}{4\pi} \frac{Id\vec{l} \times \hat{r}}{r^2} \]
\[ B = \frac{\mu_0 I}{2\pi \xi} \]
\[ B = \frac{\mu_0 I}{2a} \]
\[ \int (\vec{B} \cdot d\vec{l}) = \mu_0 I_{\text{enclosed}} \]
\[ B = \mu_0 n I \]
\[ U = -\vec{\mu} \cdot \vec{B} \]
\[ \cos 60^\circ = \frac{1}{2} \]