$\Rightarrow \boxed{\phi = 1.73 \text{ eV}}$

c) Cut off wavelength $\lambda_0 = \frac{c}{f_0} = \frac{3\times10^{8}}{4.1\times10^{14}} = \boxed{7.32\times10^{-7}\text{m}}$

d) accepted value of $h = 6.626\times10^{-34}$ J.s

our value is 6.77×10^{-34} J.s

% difference $= \frac{6.77\times10^{-34} - 6.626\times10^{-34}}{6.626\times10^{-34}} = \boxed{2.2\,\%}$

b# 29.

γ- rays $E = 1.02$ MeV

Scattering is symmetric ($\theta = \phi$)

$\theta = ?$ and $E' = ?$

Eq. 2.30 in the text book $p = p'\cos\theta + p_e\cos\theta$ — (1)

2.31 in the textbook $p' = p_e$ — (2)

but $p = \frac{hc}{\lambda}$ and $p' = \frac{hc}{\lambda'} = p_e$

$\Rightarrow$ (1) gives $\frac{hc}{\lambda} = \frac{hc}{\lambda'}\cos\theta + \frac{hc}{\lambda'}\cos\theta$

$= \frac{2hc}{\lambda'}\cos\theta$ — (3)

$\Rightarrow \frac{1}{\lambda} = \frac{2\cos\theta}{\lambda'}$ or $\cos\theta = \frac{\lambda'}{2\lambda}$ — (4)

but we know that $\lambda' - \lambda = \frac{h}{m_e c}(1-\cos\theta) = \lambda_c(1-\cos\theta)$ (5)

$\uparrow$ Compton wavelength for the electron.