7. (a) At the magnetic equator ($\lambda_m = 0$), the field is

$$B = \frac{\mu_0 \mu}{4\pi r^3} = \frac{\left(4\pi \times 10^{-7}\,\mathrm{T{\cdot}m/A}\right)\left(8.00 \times 10^{22}\,\mathrm{A{\cdot}m^2}\right)}{4\pi(6.37 \times 10^6\,\mathrm{m})^3} = 3.10 \times 10^{-5}\,\mathrm{T}\ ,$$

and $\phi_i = \tan^{-1}(2\tan\lambda_m) = \tan^{-1}(0) = 0$.

(b) At $\lambda_m = 60°$, we find

$$B = \frac{\mu_0 \mu}{4\pi r^3}\sqrt{1 + 3\sin^2\lambda_m} = (3.10 \times 10^{-5})\sqrt{1 + 3\sin^2 60°} = 5.6 \times 10^{-5}\,\mathrm{T}\ ,$$

and $\phi_i = \tan^{-1}(2\tan 60°) = 74°$.

(c) At the north magnetic pole ($\lambda_m = 90.0°$), we obtain

$$B = \frac{\mu_0 \mu}{4\pi r^3}\sqrt{1 + 3\sin^2\lambda_m} = (3.1 \times 10^{-5})\sqrt{1 + 3(1.00)^2} = 6.20 \times 10^{-5}\,\mathrm{T}\ ,$$

and $\phi_i = \tan^{-1}(2\tan 90°) = 90°$.