1) $$\frac{\lambda}{2R} = \left(\frac{hc}{E_\gamma}\right) \Big/ 1.2A^{1/3} = \left(\frac{6.626\times10^{-34}\ J\cdot s \ \ 3\times10^{8}\ m/s}{1.332\times10^{6}\ eV \times 1.602\times10^{-19}\ \frac{J}{eV}}\right)\left(\frac{1}{1.2(6\phi)^{1/3}\ 2\times10^{-15}\ m}\right)$$

$$\frac{\lambda}{2R} = \frac{9.31\times10^{-13}\ m}{2(4.7\phi\times10^{-15}\ m)} = \frac{198.}{2} = 99.$$

2) a ① $4^+ \longrightarrow 2^+$ @ 1.168 MeV $\ell=2$, no $\rightarrow$ E2

② $4^+ \longrightarrow 2^+$ @ .6ϕ5 MeV $\ell=2$, no $\rightarrow$ E2

③ $4^+ \longrightarrow \phi^+$ @ ϕ MeV $\ell=4$, no $\rightarrow$ E4

b $\lambda_{sp}(E2) = 7.28\times10^{7}\ A^{4/3}\ E_\gamma^{5}$

$\lambda_{sp}(E4) = 1.\phi7\times10^{-5}\ A^{8/3}\ E_\gamma^{9}$

Table 9.2 in textbook

① $E_\gamma = 1.4\phi\phi6 - 1.168\ MeV = \phi.2326\ MeV$

$\lambda_{sp}^{①}(E2) = 7.28\times10^{7}\ (134)^{4/3}\ (\phi.2326)^5 = 3.39\times10^{7}\ /s$

② $E_\gamma = 1.4\phi\phi6 - \phi.6\phi47\ MeV = \phi.7959\ MeV$

$\lambda_{sp}^{②}(E2) = 7.28\times10^{7}\ (134)^{4/3}\ (\phi.7959)^5 = 1.59\times10^{9}\ /s$

③ $E_\gamma = 1.4\phi\phi6 - \phi. = 1.4\phi\phi6\ MeV$

$\lambda_{sp}^{③}(E4) = 1.\phi7\times10^{-5}\ (134)^{8/3}\ (1.4\phi\phi6)^9 = 1\phi4.\ /s$

$\Rightarrow$ largest transition rate to the $\phi.6\phi5$ MeV state