Ans 2.3) $\rho_c = 0.92 \times 10^{-26} \times h_{70}^2 \ kg\,m^{-3}$

$h_{70} = 1, \ h_\circ = 0.7$

$\hbar = 6.6 \times 10^{-16} \ eV\,s$

$1 eV = 1.6 \times 10^{-19} \ J = 1.6 \times 10^{-19} \ kg\,m^2\,s^{-2}$

$c = 3 \times 10^8 \ m\,s^{-1}$

$$(1\ kg\,m^{-3}) \times \hbar^3 \times c^5 = 1 \times (6.6 \times 10^{-16})^3 \times (3 \times 10^8)^5$$
$$\times \left[kg\,m^{-3} \times eV^3 s^3 \times m^5 s^{-5} \right]$$

$$= 2.875 \times 10^{-46} \times 2.43 \times 10^{42} \ kg\,m^2 s^{-2} eV^3$$

$$= 6.986 \times 10^{-4} \ J\,eV^3$$

$$= \frac{6.986 \times 10^{-4}}{1.6 \times 10^{-19}} \ eV^4$$

$$\therefore (1\ kg\,m^{-3}) \hbar^3 c^5 = 4.366 \times 10^{15} \ eV^4$$

i.) $\rho_c = 0.92 \times 10^{-26} \times h_{70}^2 \ kg\,m^{-3}$

$\Rightarrow \rho_c \hbar^3 c^5 = 4.017 \times 10^{-11} \ eV^4$

$$\therefore \boxed{\rho_c \sim 4.017 \times 10^{-11} \times h_{70}^2 \ eV^4} \quad \text{Ans.}$$

ii) $$\rho_c = 0.92 \times 10^{-26} \times h_{70}^2 \ kg\,m^{-3}$$

~~$= 0.92 \times 10^{-26} \times kg \times$~~

$h_{70} = 1, \ h_8 = 0.7$

$$\Rightarrow \rho_c = \frac{0.92 \times 10^{-26} \times h^2}{(0.7)^2} \ kg\,m^{-3}$$

$$\therefore \rho_c = 1.877 \times 10^{-26} \times h^2 \ kg\,m^{-3}$$

$$\rho_c h^3 c^5 = 8.195 \times 10^{-11} h^2 \ eV^4$$

$$\therefore \boxed{\rho_c \sim 8.195 \times 10^{-11} \times h^2 \ eV^4} \quad \text{Ans}$$