ASTR700 Lecture 1: Introduction (ERA chapter 1)

Think for yourself (without peeking at notes)...
NOTE: These should serve as conceptual helpers/reminders for you but do not cover all topics you're responsible for knowing.

1. Important equations from today. What do they mean/imply? What are they used for?

$$c = \lambda\nu \tag{1}$$

$$E = h\nu \tag{2}$$

$$E = P = kT \tag{3}$$

$$T_{\rm min} = \frac{h\nu}{k} \tag{4}$$

$$\frac{h\nu}{kT} \ll 1 \tag{5}$$

$$\nu_{\rm p} = \sqrt{\frac{e^2\, n_{\rm e}}{\pi\, m_{\rm e}}} \simeq 8.97\,{\rm kHz}\sqrt{\frac{n_{\rm e}}{\rm cm^{-3}}} \tag{6}$$

2. By when do I need to tell my student-led lecture topics to SBS? When should I start preparing for my lecture?

3. What physical processes mark the boundaries of the radio spectrum?

4. Estimate the frequency cutoff at which the ionosphere typically prevents passage of astronomical radio waves to earth. Does this provide a high or low frequency limit?

5. What are the wavelength and frequency range covered by the radio spectrum?

6. Why is the $h\nu/(kT) \ll 1$ limit important for radio astronomy?