

Lecture Questions: Nuclear Energy

1. What exactly is 'radioactivity' and how is it emitted?
2. Describe the *uranium decay series* in some detail. Include examples of both alpha and beta decay.
3. During beta decay, an electron is ejected from the nucleus. But atomic nuclei contain protons and neutrons, not electrons. Reconcile this apparent contradiction.
4. What are the environmental benefits of nuclear power?
5. What percentage of electricity is generated by nuclear power plants
 - (a) in the US?
 - (b) globally?
6. What does it mean when we say that uranium is 'enriched?' Why must it be enriched? How is it done?
7. Explain how U-235 fission is controlled in a nuclear power plant. In your answer, be sure to include an explanation of the role of the following: the neutron source, control rods, moderator, secondary coolant.
8. What is a breeder reactor? How does it work? In what ways is it attractive?
9. What are the options to dispose of spent nuclear fuel?