Major Topics from Option C: Energy

Note: These are the major topics covered by the test, though you should expect some questions will come from the notes and your reading assignments.

C.1 – Energy Sources

- Differentiate renewable & nonrenewable fuels.
- Solve problems involving energy density & specific energy.
- Contrast primary & secondary sources of energy.

C.2 – Fossil Fuels

- Be able to overview the production of each fossil fuel we discussed in class.
- List the type(s) of pollution produced by every energy source we discuss in this chapter.
- Describe the refining process for crude oil, as well as some of the products we obtain from petroleum.
- Describe cracking and how/why it is accomplished.
- Describe octane and its relationship to knocking.
- Explain what coal gasification is.
- Define the term carbon footprint.

C.3 – Nuclear Fission & Fusion

- Describe nuclear decay & its cause.
- Overview alpha, beta, & gamma radiation.
- Explain the mass defect and its relationship to nuclear stability.
- Differentiate fission and fusion, including the actual reaction, any pollution produced, and their current usage.
- Explain the advantages of fusion over fission & why only fission is used to produce electricity.
- Describe what a critical mass is.
- Overview the enrichment process of uranium and how breeder reactors are used.
- Describe the half-life of an isotope.
- Describe where environmental radon comes from, its danger, and steps to reduce exposure.

C.4 – Solar Energy

- Be able to outline the advantages and disadvantages of solar energy production and usage.
- Describe the molecules in plants that absorb light energy and how they differ.
- Be able to list the reaction for photosynthesis and describe why it is a redox reaction.
- Describe how ethanol is produced, as well as the positives and negatives of using biofuels.

C.5 – Environmental Impact: Global Warming

- Describe the greenhouse effect in detail.
- Describe the relationship between the greenhouse effect and global warming.
- List the four major greenhouse gases (and their sources) and their relative contribution to global warming. (pg 553)
- Explain how the pH of the ocean is affected by fossil fuel usage and its impact on shelled organisms.
- Overview the three strategies for reducing atmospheric CO₂.