

Name: _____
Last First

Student ID Number: _____

Read directions very carefully. Write your answer legibly in the designated spaces. *Total number of points is 175.*

1. If an appliance runs at a current of 10 A, how many kWh of electricity will it use in 45 minutes? Assume that this appliance is operating using standard US electricity.

15 points

2. List five specific types of pollution associated with coal combustion. For each class of pollutants, briefly describe how and why they are formed, how can their formation be minimized, and what are their health and environmental effects.

30 points

(1)

(2)

(3)

(4)

(5)

3. Succinctly define, in your own words, the following concepts:

4×5 points = 20 points

Pumped Storage

Moderator (in nuclear energy)

Associated Natural Gas

Hydraulic Fracturing

4. Compare environmental and security risks associated with (a) mining/extraction and (b) transportation of "easy oil" and coal.

10 points

5. According to the EIA, what are coal's prospects in the coming decade in the U.S.? In India?

2 points

US:

India:

6. According to the EIA (“What is Shale Gas?”), what are three basic environmental issues associated with fracking to produce shale gas?

3 points

(a)

(b)

(c)

7. How does Deborah Gordon define “transitional fuels”?

3 points

List two such fuels: (1)

(2)

8. According to “Saudi America,” how does the production curve for a tight-oil well differ from that of a traditional oil well?

2 points

9. According to “Saudi America,” what are the three most significant basins for shale oil production in the United States?

3 points

(a)

(b)

(c)

10. According to Gordon, which type of fuel is most likely to replace traditional oil if global markets alone shape energy use in the future?

1 point

11. Which region led the world in the production of easy oil from 1901 to the 1950s?
1 point
12. What is the name and location of the largest developed oil field in the world?
1 point
13. What two key differences in shale production in the U.S. and Europe does the author of “Bonanza” use to explain the barriers to shale gas production in Europe?
2 points
- (a)
- (b)
14. According to “Bonanza,” which nation was the largest exporter of LNG in the world in 2011?
2 points

Where did the U.S. rank on this list?

Future of Fossil Fuels (30 minutes):

In the absence of stricter regulations on greenhouse gases, which of the primary fossil fuels—coal, oil (including unconventional oil), or natural gas (including shale gas and LNG)—do you think will grow most rapidly in the United States between 2014 and 2040? Use the course materials to explain your answer.

NOTE: Write a concise introduction that directly states the fuel you have chosen and the primary reason why it will grow rapidly. This is your thesis statement. Circle it. Justify your answer with paragraphs presenting concrete information from the course materials. Finish with a strong conclusion that goes beyond a summary. For example, are there significant implications for the growth of the fuel you have chosen for national energy security?

80 points

