

NAME: _____ STUDENT NUMBER: _____

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Eco 314 – Midterm

Monday October 24 2016

PART I: MULTIPLE CHOICE QUESTIONS (25 QUESTIONS WORTH 2 MARKS EACH)

Record the best answer on the bubble sheet.

1. The fourth most common gas in the atmosphere is:
 - A. Oxygen
 - B. Argon
 - C. Nitrogen
 - D. Hydrogen
 - E. Carbon dioxide

2. The continent with the largest production of conventional oil is:
 - A. North America
 - B. South America
 - C. Africa
 - D. Europe
 - E. Asia

3. Which of the following states “Whenever energy is converted from one form to another, some of it is dissipated.”
 - A. Hotelling’s Lemma
 - B. The 1st Law of Thermodynamics.
 - C. The 2nd Law of Thermodynamics.
 - D. The Coase Theorem.
 - E. The Carnot Heat Engine

4. Which of the following is not considered to be a market failure:
 - A. monopolistic prices
 - B. externalities
 - C. goods that are not provided in sufficient quantities because a producer cannot recover costs
 - D. expensive prescription drugs
 - E. high unemployment for an extended period of time

5. Which of the following is not a primary energy source:
 - A. Wind
 - B. Crude oil
 - C. Gasoline
 - D. Coal
 - E. Uranium

6. The chemical formula $C_6H_{12}O_6 + 6O_2 = \text{energy} + 6CO_2 + 6H_2O$ describes the process of
 - A. Decomposition of organic matter
 - B. Combustion of hydrocarbon
 - C. Animal respiration
 - D. Plant photosynthesis
 - E. Carbohydrate evaporation

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7. FITs are a type of
 - A. tax on carbon
 - B. exercise watches
 - C. renewable portfolio standards
 - D. subsidies
 - E. efficiency regulations

8. Fracking relies upon which of the following new technologies
 - A. vertical drilling
 - B. the use of high pressure liquids to dilute bitumen
 - C. conversion of solid hydrocarbons to liquid fuel
 - D. horizontal drilling
 - E. fractional distillation

9. Which of these energy sources does not primarily come from the sun:
 - A. Coal
 - B. Wind power
 - C. Natural gas
 - D. Geothermal
 - E. Hydraulic energy

10. The General Electric Company was started by
 - A. Tesla
 - B. Edison
 - C. Adam Beck
 - D. Rockefeller
 - E. Vanderbilt.

11. Which of the following are not complementary technologies
 - A. horizontal drilling and fracking
 - B. wheel and plough
 - C. horseshoe and horse-collar
 - D. wind generation and solar generation
 - E. natural gas generation and solar generation

12. The current concentration of carbon dioxide in the atmosphere is approximately
 - A. 400 parts per thousand
 - B. 280 parts per million
 - C. 830 parts per million
 - D. 400 parts per million
 - E. 820 parts per thousand

13. Which of the following is not considered to be a Chinese invention:
 - A. triangular ploughs
 - B. triangular sails
 - C. early use of oil
 - D. percussion drilling
 - E. coke as fuel

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14. Some of the earliest pottery was produced during the

- A. Yuan Dynasty in China
- B. Yahyoi Period in Japan
- C. Ming Dynasty in China
- D. Jomon Period in Japan
- E. Hellenic Period in Greece

15. As early as the 13th century, oil was traded in

- A. Saudi Arabia
- B. Azerbaijan
- C. Egypt
- D. Poland
- E. Mexico

16. World consumption of oil is closest to

- A. 50 million barrels per day
- B. 33 billion barrels per year
- C. 100 thousand barrels per day
- D. 300 million barrels per year
- E. 90 billion barrels per day

17. Which of the following does not incorporate the foil principle

- A. triangular sails
- B. wind turbines
- C. parachutes
- D. gliders
- E. rectangular sails

For the following questions, refer to the attached Energy and Carbon Flow Diagrams

18. Based on the Energy Flow chart, the proportion of coal that is used for electricity generation is closest to:

- A. 10%
- B. 20%
- C. 50%
- D. 80%
- E. 90%

19. Based on Energy Flow chart, the proportion of petroleum energy devoted to transportation that is converted into useful mechanical energy is closest to:

- A. 15%
- B. 25%
- C. 67%
- D. 55%
- E. 75%

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20. Based on Energy Flow chart, the proportion of total energy used by the residential sector that comes from electricity is closest to:
- A. 50%
 - B. 20%
 - C. 40%
 - D. 70%
 - E. 30%
21. Based on Energy Flow chart, the proportion of domestic energy that does not produce energy services is closest to:
- A. 40%
 - B. 50%
 - C. 70%
 - D. 60%
 - E. 20%
22. Based on Energy Flow chart, the proportion of domestic energy that comes from hydraulic sources is closest to:
- A. 10%
 - B. 20%
 - C. 30%
 - D. 18%
 - E. 5%
23. Consider the Carbon Emissions chart. If all coal could be replaced with natural gas, the decline in total CO₂ emissions would be closest to:
- A. 4%
 - B. 7%
 - C. 12%
 - D. 16%
 - E. 20%.
24. Consider the Carbon Emissions chart. Suppose petroleum in transportation were replaced by electricity produced from non-carbon sources. Then total carbon CO₂ emissions would decrease by approximately:
- A. 5%
 - B. 15%
 - C. 25%
 - D. 30%
 - E. 40%.

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25. Consider the Carbon Emissions chart. If coal and natural gas were eliminated in the generation of electricity and replaced with some form of renewable energy, then total carbon CO₂ emissions would fall by approximately:
- A. 6%
 - B. 22%
 - C. 16%
 - D. 32%
 - E. 3%.

PART II: WRITTEN ANSWER QUESTIONS
5 QUESTIONS WORTH 10 MARKS EACH

26. Oil prices have dropped dramatically since mid-2014. Provide an explanation of this decline in price. Is this decline different from the one that occurred during the 1980's? If so, why? What do you expect to happen to oil prices in the coming years?
27. Explain the concept entitled "energy policy triangle". Using a specific example of a recent or forthcoming policy decision outline the trade-offs and considerations that are involved.
28. Define each of the following types of efficiency and suggest an example from energy economics that applies in each case: allocative efficiency, productive efficiency, dynamic efficiency, social efficiency, X-efficiency.
29. State the keywords that you have used to set up your energy related Google (or other) news alert. Describe the main message of 3 alerts that you have received.
30. Discuss the role of the foil in enabling the 'first globalization'. What was the previous route by which trade between Europe and China/India took place? Why did European empires seek an alternative route?

FIGURE 1

Canada Energy Flow
in 2014: 20,628 PJ

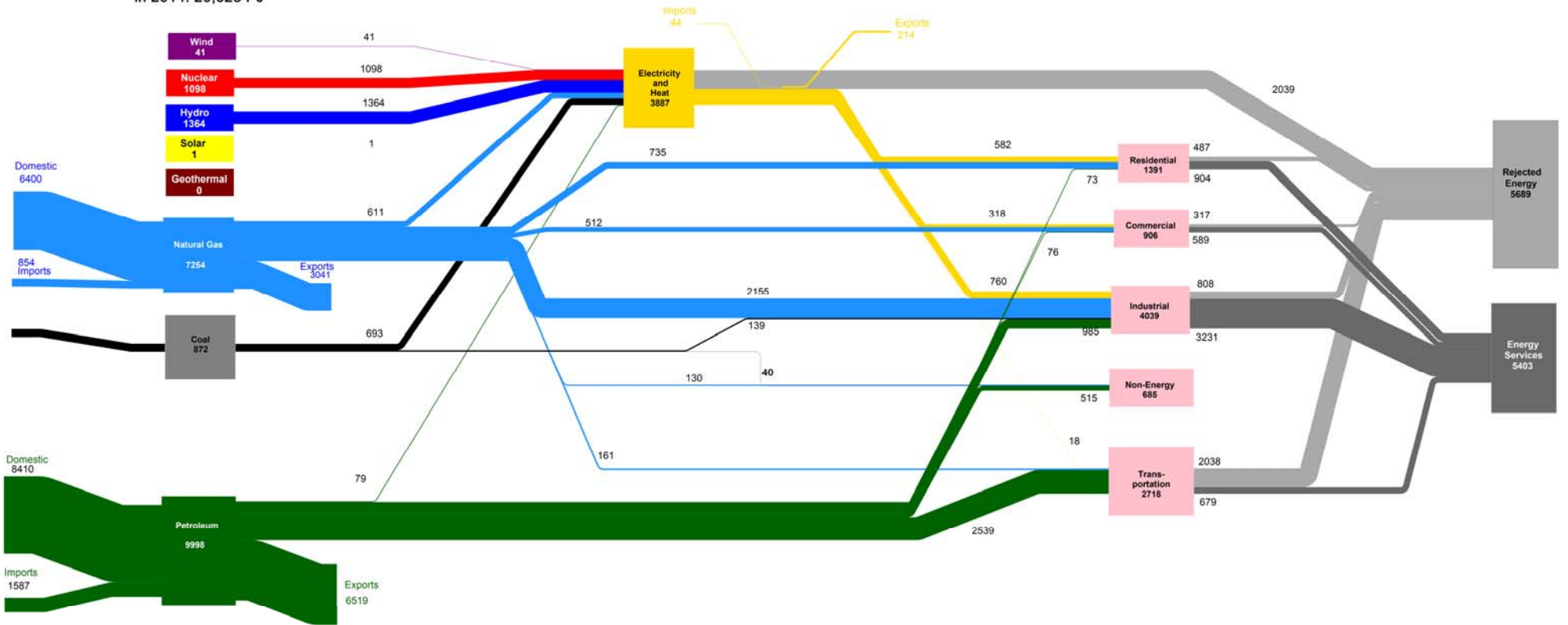


FIGURE 2

Canada Carbon Flow Emissions
in 2014: 574 Million Metric Tons
(Does not include other GHGs)

