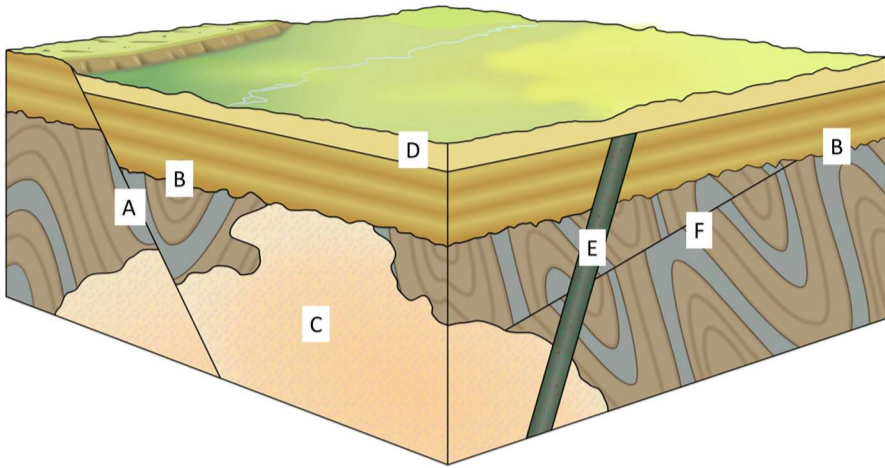


[Hydrological and Carbon Cycle] Final Exam.

December 18th, 2017

Affiliation (소속)	Student ID (학번)	Name (이름)

1. Cross-cutting relations can be used to determine the relative ages of rock strata and other geological structures. Describe each geologic event and the order of the events in brief. [10 pts.]



2. Describe the difference between porosity and permeability. [10 pts.]

3. Explain why most fossil fuels are found in sedimentary rock formations. [10 pts.]

4. Explain the dynamic Rock Cycle with 8 keywords. Your Explanations must not exceed 16 sentences. [10 pts.]

5. On geologic time scales, the carbon cycle functions as a _____. [2 pts.]

- a) positive feedback
- b) negative feedback

6. The “hothouse” climates of the past existed because _____. [2 pts.]

- a) of changes in the “set point” of the thermostat due to continental geography and volcanic degassing
- b) these excursions were too short-lived for the thermostat to control them

7. The oceans, through the glacial/interglacial climate fluctuations, have acted as a _____ feedback to climate forcing. [2 pts.]

- a) positive
- b) negative

8. This decade, the oceans are acting as a _____ feedback to human-driven climate changes. [3 pts.]

- a) positive
- b) negative

9. Currently, the role of the land surface in the carbon cycle is a _____. [3 pts.]

- a) positive feedback to human CO₂ release from deforestation and fossil fuel combustion
- b) negative feedback

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10. The Battery of the Biosphere consists of _____. [3 pts.]

- a) igneous rocks and CO₂
- b) CaCO₃ (carbonate) rocks and CO₂
- c) organic carbon and O₂
- d) organic carbon and CO₂

11. Which of these contains the most reduced form of carbon? [3 pts.]

- a) CO₂
- b) CH₂O
- c) CH₄

12. If you accelerate the rate of weathering by building mountains (exposing more rock to the atmosphere), Earth's climate will _____. [3 pts.]

- a) cool
- b) warm

13. The Urey reaction is: $\text{CaSiO}_3 + \text{CO}_2 \rightleftharpoons \text{CaCO}_3 + \text{SiO}_2$. Which side of this reaction has a compound found in igneous rocks? [3 pts.]

- a) the left side
- b) the right side

14. At high temperature the Urey (weathering / metamorphism) reaction favors _____. [3 pts.]

- a) a lower CO₂ concentration
- b) a higher CO₂ concentration

15. At high temperature, the equilibrium state of the Urey reaction favors carbon in the form of _____. [3 pts.]

- a) CaCO₃
- b) CO₂

16. The _____ exhibits the most fluctuations in atmospheric CO₂ during its annual cycle. [3 pts.]

- a) Northern hemisphere
- b) Southern hemisphere
- c) Western hemisphere
- d) Eastern hemisphere

17. Which of these holds the smallest amount of carbon? [3 pts.]

- a) ocean
- b) solid Earth
- c) land surface

18. Which of the following reservoirs contains the most carbon? [3 pts.]

- a) living things
- b) the ocean
- c) the land surfaces
- d) the atmosphere

19. The best coal comes from _____. [3 pts.]

- a) fresh-water swamps
- b) salt-water swamps
- c) ocean plankton
- d) all of the above

20. Which of the following consists of long, linear chains of carbon atoms? [3 pts.]

- a) oil
- b) coal
- c) natural gas

21. Which of the following is mainly used to generate electricity? [3 pts.]

- a) coal
- b) gas
- c) oil

22. The burning of which of the following is the main cause of acid rain? [3 pts.]

- a) coal
- b) natural gas
- c) oil

23. The recent anthropogenic increase in atmospheric methane is due primarily to changes in _____. [3 pts.]

- a) smog chemistry
- b) sulfate aerosols
- c) the rate of methane oxidation
- d) the rate at which methane is being released to the atmosphere

24. The lifetime of methane in Earth's atmosphere is _____. [3 pts.]

- a) one or a few years
- b) one or a few decades
- c) one or a few centuries
- d) one or a few millennia
- e) ten thousand years or longer

25. Today, the land surface is _____. [3 pts.]

- a) a net source of CO₂ to the atmosphere
- b) a net sink absorbing CO₂ from the atmosphere

----- This is the end line of the Final Exam. -----