**The Earth Through Time, 10th Edition**

**by Harold L. Levin**

# Chapter 1—The Science Of Historical Geology

**Multiple Choice Questions**

**Select the best answer.**

1. Which of the following does the study of past geologic events apply?

a. Predicting future geologic events

b. Discovery of future oil deposits

c. Understand climatic cycles

d. Changes to the fossil record

e. All the above

2. What is the age of the Earth?

a. 4.56 million years

b. 5.46 billion years

c. 4.38 billion years

d. 4.56 billion years

e. 4.03 billion years

3. A theory is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

a. an unproven beliefs.

b. a hypothesis.

c. a well established explanation of a set of observation.

d. a well established belief.

e. a poorly documented observations.

4. Primates leading to Homo sapiens appeared in the geologic record between \_\_\_\_\_\_\_\_\_\_\_.

a. 5,000 years to 15,000 years ago.

b. 150,000 years to 300,000 years ago.

c. 5 million years to 10 million years ago.

d. 25,000 years to 50,000 years ago.

e. 5,00 years to 5,000 years ago.

5. Which of the following is (are) a typical physical geology topic(s)?

a. Structure of the Earth.

b. Plate tectonics.

c. Minerals.

d. Paleogeography.

e. All but d.

6. Which of the following is (are) a typical historical geology topic(s):

a. Relative age dating.

b. Study of rocks

c. Minerals.

d. Gold mining

e. All but a.

7. Historical geologist observe the \_\_\_\_\_\_\_ and work backwards towards their \_\_\_\_\_\_\_\_\_.

a. Cause, result.

b. Beginning, finish.

c. Result, cause.

d. Center, result.

e. Results, causes.

8. Exploration geologists rely on which of the following disciplines?

a. Biology.

b. Chemistry.

c. Physics.

d. Mathematics.

e. All the above.

9. Which of the following is a part of the human body not longer used?

a. Ribs.

b. Small intestine.

c. Tail bone.

d. Claws.

e. Blow hole.

10. Which of the following would be the appropriate order for applying the Scientific Method?

a. Question 🡺 hypothesis 🡺 observation 🡺 theory.

b. Theory 🡺 hypothesis 🡺 observation 🡺 question.

c. Hypothesis 🡺 theory 🡺 observation 🡺 question.

d. Observation 🡺 hypothesis 🡺 theory 🡺 question.

e. Theory 🡺 observation 🡺 hypothesis 🡺 question.

11. Which of the following Scientific Method terms expresses the highest degree of confidence in an idea?

a. Question.

b. Observation.

c. Hypothesis.

d. Theory.

e. Data.

12. The Scientific method requires multiple research teams to validate the same conclusion before a(n) \_\_\_\_\_\_\_\_\_\_\_\_\_\_ can be elevated to (a) \_\_\_\_\_\_\_\_\_\_\_\_\_.

a. Theory, hypothesis.

b. Observation, data.

c. Anaximander.

d. Hypothesis, theory.

e. Theory, hypothesis.

13. The Mediterranean mystery was solved, in part, by the collection of which of the following observations?

a. Oil and gas.

b. Terrestrial fossils.

c. Meteorites.

d. Marine fossils.

e. Comets.

14. What modern analog was sited to explain the drying period in the history of the Mediterranean Sea?

a. Death Valley.

b. San Andreas Fault.

c. East African Rift.

d. Ireland.

e. None of the above.

15. Decay of a radioactive element will end with the creation of \_\_\_\_\_\_\_.

a. Particles that are expelled.

b. Daughter atoms.

c. Rock outcrops in Canada.

d. Divergent boundaries.

e. Natural selection.

16. A mineral containing 25 parent atoms and 75 daughter atoms must

a. Have formed only days ago.

b. Be at the age corresponding to the second half-life.

c. Be at the age corresponding to the fourth half-life.

d. Be at the age corresponding to the first half-life.

e. Be worthless for age dating.

17. The age of the oldest rock thus far dated on Earth is

a. 4.56 billion years.

b. 4.03 billion years.

c. 704 million years.

d. 2,600 years.

e. 5.56 million years.

18. If you move one foot a day for 100,000 years how for did you go?

a. 80,199 miles.

b. 100,000 feet.

c. 15.1 miles.

d. 6,918 miles.

e. 1,100,235 feet.

19. Natural selection operates on the idea of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

a. Least favorable variations pass to the next generation.

b. Survival of the fittest.

c. Survival of the unfit.

d. Mutation of DNA is always unfavorable.

e. Appearance of useless organs.

20. What is the age of the oldest mineral from the Earth’s crust?

a. 4.38 billion years.

b. 4.03 billion years.

c. 3.81 million years.

d. 4.38 million years.

e. 4.03 billion years.

21. The \_\_\_\_\_\_\_\_\_ is composed of part of the mantle and all the crust.

a. Inner core.

b. Outer core.

c. Asthenosphere.

d. Lower mantle.

e. Lithosphere.

22. Which of the following is not a plate tectonic boundary?

a. Split boundary.

b. Convergent boundary.

c. Divergent boundary.

d. Transform boundary.

23. C. Darwin and \_\_\_\_\_\_\_\_\_ are credited with scientifically validating the Theory of Evolution.

a. W. Smith.

b. T. Hutton.

c. A. R. Wallace.

d. K. Hsu

e. S. Bowring.

**Answers to Questions**

1. e 11. d 21. e

2. d 12. d 22. a

3. c 13. e 23. c

4. b 14. d

5. e 15. b

6. a 16. b

7. c 17. b

8. e 18. d

9. c 19. b

10. a 20. a

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**Multiple Choice Questions**

1. What is the scientifically-accepted age of the Earth?

1. 4.56 billion years
2. 6,000 years
3. 4.56 million years
4. 3.56 billion years
5. 3.96 million years

Ans: a

Feedback: See pages 1 and 7

2. When did *Homo sapiens* appear on Earth?

1. 65 to 66 million years ago
2. 150,000 to 300,000 years ago
3. about 1 million years ago
4. 15,000 to 30,000 years ago
5. 4,000 to 6,000 years ago

Ans: b

Feedback: See page 1

3. The branch of geology that deals with Earth materials and processes is:

1. geochronology.
2. physical geology.
3. paleontology.
4. historical geology.
5. molecular biology.

Ans: b

Feedback: See pages 1-2

4. The branch of geology that deals with the origin and changes of Earth and life through time and space is:

1. geochronology.
2. physical geology.
3. paleontology.
4. historical geology.
5. molecular biology.

Ans: d

Feedback: See pages 1-2

5. Using the scientific method, geologists were able to determine that which body of water was once a desert with a giant salt lake?

1. Black Sea
2. Baltic Sea
3. Mediterranean Sea
4. Caribbean Sea
5. Atlantic Ocean

Ans: c

Feedback: See pages 5-7

6. The original way of determining which rocks are older and which are younger is called:

1. relative age.
2. absolute age.
3. natural selection.
4. plate tectonics.
5. method of multiple working hypotheses.

Ans: a

Feedback: See page 8

7. An hypothesis that survives close examination and repeated challenges, and is supported by a large body of evidence, with a very high probability of being correct is called a:

1. scientific law.
2. hypothesis.
3. theory.
4. observation.
5. good guess.

Ans: c

Feedback: See page 3

8. The discovery of radioactivity in 1896 eventually gave us the tools to find:

1. the relative age of a rock.
2. the force that moves the tectonic plates.
3. a mechanism for evolution.
4. the absolute age of a rock.
5. changes in the chemistry of oceans and the atmosphere.

Ans: d

Feedback: See page 7

9. The easily deformed or partially molten part of mantle, below the lithosphere, is called the:

1. plate.
2. crust.
3. transform.
4. asthenosphere.
5. lithosphere.

Ans: d

Feedback: See page 7

10. Tectonic plates move toward one another at what type of plate boundary?

1. convergent
2. divergent
3. transform

Ans: a

Feedback: See page 7

11. Natural selection is supported by which of the following?

1. Any given species produces more offspring than can survive to maturity.
2. Variations exist among the offspring.
3. Offspring must compete with one another for food and habitat.
4. Offspring with the most favorable characteristics are more likely to survive to reproduce, and pass those traits along to the next generation.
5. All of the above supports natural selection.

Ans: e

Feedback: See page 9

12. Which one of these statements about evolution is incorrect?

1. Fossils provide direct evidence for changes in life in rocks of different ages.
2. Certain organs or structures are present in a variety of species, but they are modified to function differently. Differences in structures can help an organism be more competitive.
3. Modern organisms contain useless organs that had a useful function in ancestral species.
4. Animals that are very different have very different-looking embryos.
5. Biochemistry of closely-related organism is similar, but very different from more distantly related organisms.

Ans: d

Feedback: See page 9

13. What is a half-life?

1. half of the time it takes a parent radioactive element to decay
2. the midpoint in the life of an organism
3. the midpoint in the duration of a species
4. the time it takes for half of the original quantity of radioactive atoms to decay
5. the time it takes for half of the original quantity of daughter atoms to decay

Ans: d

Feedback: See page 7

14. Convectional flow in the Earth’s mantle causes:

1. genetic variations in organisms.
2. Earth’s magnetic field.
3. Earth’s gravitational field.
4. radioactive decay of the elements.
5. movement of tectonic plates.

Ans: e

Feedback: See page 8

15. Plants and animals of each geologic era arose from earlier species by what process?

1. scientific method
2. organic evolution
3. radioactive decay
4. plate movement
5. transform movement

Ans: b

Feedback: See page 9