1. The Hadean and Archean eons include about _________ percent of Earth’s history.
   A) 4 to 5
   B) 54
   C) 45
   D) 90
   Page: 242
   Preamble

2. Select from those listed below the incorrect reason that Archean rocks are rare on Earth’s surface.
   A) Erosion has destroyed many Archean rocks.
   B) Metamorphism has altered many Archean rocks so that they cannot be dated properly.
   C) Archean rocks have plentiful, yet small, index fossils.
   D) Archean rocks tend to be buried below sedimentary and volcanic rocks.
   Page: 242
   Preamble

3. Meteorites made of iron with olivine crystals are called
   A) stony-iron meteorites.
   B) iron meteorites.
   C) stony meteorites.
   D) cratons.
   Page: 244
   The Ages of the Planets and the Universe

6. The first surface of Earth was likely a
   A) feldspar-rich crust.
   B) magma ocean.
   C) layer of gold and platinum.
   D) Precambrian craton.
   Page: 248
   The Hadean Eon

8. The origin of Earth’s early atmosphere was the due to
   A) the impact of a Mars-sized planet shortly after Earth’s accretion.
   B) atmospheres of asteroids and comets that struck Earth as it formed.
   C) degassing of Earth’s interior over time.
   D) chemical reactions in the crust and in the early atmosphere.
   Page: 249
The Hadean Eon

9. Our planet's early ocean was formed by
   A) atmospheres of asteroids and comets that struck Earth as it formed.
   B) volcanic emission of water vapor.
   C) chemical reactions in the crust and in the early atmosphere.
   D) melting of polar ice caps.
   Page: 249

The Hadean Eon

11. The axial tilt of Earth is likely due to
    A) once-great magma oceans.
    B) asteroid impacts.
    C) the surface distribution of water oceans.
    D) volcanic events of great size.
    Ans: B   Page: 250

The Hadean Eon

15. The oldest known crustal materials, fragments from crustal rocks as much as 4.38 billion years old, are
    A) volcanic rock fragments.
    B) zircon crystals.
    C) quartz crystals.
    D) uranium-bearing rocks.
    Page: 251

The Origin of Continental Crust

17. Archean chert was precipitated as a result of
    A) banded-iron formations.
    B) greenstone belt metamorphism.
    C) bacterial action in sediments.
    D) submarine volcanic eruptions.
    Ans: D   Page: 253

Greenstone Belts

19. Increasing area of shallow seafloor during Archean promoted growth of
    A) biomarkers.
    B) stromatolites.
    C) bacteria.
    D) eukaryotic cells.
    Page: 256

Evidence of Archean Life
20. The nucleic acid likely to have been present in the earliest life forms, RNA, was the genetic basis for an early ecosystem on Earth called
A) the amino acid planet.
B) DNA world.
C) RNA world.
D) the nucleic acid world.

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Chemical Evidence Bearing on the Origin of Life

27. The survival of pyrite grains transported with other Archean sediments shows us that bacteria-produced oxygen was
A) very rapidly building in the early atmosphere.
B) being taken out of the atmosphere by sinks in early Earth.
C) not yet forming and would require more time for evolution to change that fact.
D) no match for the vast quantities of oxygen produced in other ways.

Page: 261
Atmospheric Oxygen

30. Although the origin is unclear, most cratons of the world experienced major episodes of metamorphism between __________ billion years ago.
A) 2.3 and 2.7
B) 3.3 and 3.5
C) 1.3 and 2.3
D) 2.7 and 3.3

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Greenstone Belts

1. Cratons of modern proportions first began to form during
A) Neoproterozoic
B) Mesoproterozoic
C) Paleoproterozoic
D) late Archean

Page: 266
A Modern Style of Orogeny

2. In the Wopmay orogenic sequence of sediments, the oldest sediments are
A) quartz sandstone that grades westward into deep-water mudstones and turbidites.
B) flysch deposits, mainly turbidites, overlain by mudstones.
C) river deposits with conspicuous cross-bedding.
D) carbonate rocks that contain abundant stromatolites.
A Modern Style of Orogeny

4. The Wopmay orogeny, involving the Slave craton and an island arc, tells us that
A) the Proterozoic crust was still hot and plastic like the Archean crust.
B) there were no glaciers present on Earth at this time.
C) Proterozoic orogenies are much like Phanerozoic orogenies.
D) we should not look for Proterozoic flysch and molasse deposits.

Pages: 268 and 269

Global Events of the Paleoproterozoic and Mesoproterozoic

7. The intracellular body called a chloroplast was originally
A) a stromatolite.
B) some DNA and RNA.
C) a cyanobacterial cell.
D) a mitochondrion.

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Global Events of the Paleoproterozoic and Mesoproterozoic

8. The key evolutionary step that allowed one cell to engulf another was the
A) absorption of mitochondria.
B) development of a cytoskeleton.
C) retention of chloroplasts.
D) evolution of photosynthesis.

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Global Events of the Paleoproterozoic and Mesoproterozoic

9. Believed to be the __________ of dinoflagellates, the __________ were the most common algal plankton of the Paleozoic and Neoproterozoic.
A) biomarkers; stromatolites
B) chloroplasts; eukaryotes
C) resting cysts; acritarchs
D) cytoskeletons; bacteria

Ans: C  Page: 270

Global Events of the Paleoproterozoic and Mesoproterozoic

10. Until at least halfway through Paleoproterozoic, the main producers in Earth’s marine ecosystems were
A) acritarchs.
B) multicellular algae.
C) eukaryotes.
D) bacteria, including cyanobacteria.
Page: 270
Global Events of the Paleoproterozoic and Mesoproterozoic

12. In Neoproterozoic rocks about 570 million years old, evidence of multicellular animal life appears in the form of
A) biomarkers.
B) resting stages of dinoflagellates.
C) trace fossils, imprints of soft-bodied fossils, and skeletal fossils.
D) permineralized cytoskeletons.

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The Beginnings of Animal Life

13. The bilaterally symmetrical soft-bodied Ediacaran fossil Kimberella is thought to represent the modern __________ group.
A) lophotrochozoan
B) ecdysozoan
C) deutorozoon
D) dinoflagellate

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The Beginnings of Animal Life

14. Advanced Ediacaran fossils include animals resembling all those following except
A) fishes.
B) arthropods.
C) mollusks.
D) cnidarians.

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The Beginnings of Animal Life

15. The Neoproterozoic radiation of large, conspicuous animals a few million years __________ suggests that there may have been a connection.
A) after the third major ice age of the Neoproterozoic
B) before the first Neoproterozoic ice age
C) after the start of the second Neoproterozoic ice age
D) after the Neoproterozoic decline in atmospheric oxygen

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The Beginnings of Animal Life
17. The main exposed part of the North American craton (Laurentia) that was assembled from at least five microcontinents between 1.95 and 1.85 billion years ago is called the
A) Archean terranes.
B) Superior Province.
C) Wyoming and Hearne provinces.
D) Canadian Shield.
   Ans: D  Pages: 281 and 282

The Assembly of North America

18. The Proterozoic Keweenawan basalts
A) formed in the closing ocean between the Wyoming and Hearne provinces.
B) covered much of the Canadian Shield.
C) formed in the island arc that collided with the Slave Province.
D) erupted in a great, elongate rift that threatened to tear apart North America.
   Page: 282
   The Assembly of North America

19. The orogeny that built mountains along the east coast of North America during Proterozoic is called
A) Wopmay.
B) Blue Ridge.
C) Grenville.
D) Llano.
   Page: 284
   The Assembly of North America

20. The great Proterozoic supercontinent, which was split apart between about 700 and 800 million years ago, is called
A) Rodinia.
B) Laurentia.
C) Columbia.
D) Gondwanaland.
   Pages: 284 and 285
   The Assembly and Breakup of Neoproterozoic Supercontinents

21. The basin that is now called the Pacific Ocean was formed during __________ by the rifting of __________.
A) Mesoproterozoic; Gondwanaland
B) Neoproterozoic; Rodinia
C) Mesoproterozoic; Rodinia
D) Neoproterozoic; Gondwanaland

The Assembly and Breakup of Neoproterozoic Supercontinents

29. The Paleoproterozoic shift at about 1.9 billion years ago from banded-iron formations to red beds signals the
A) demise of the cyanobacteria and the rise of the eukaryotic algae.
B) end of “snowball Earth.”
C) buildup of significant oxygen in the atmosphere and oceans.
D) transition from flysch to molasse deposition in many large basins.

The Beginnings of Animal Life