1. Which one of the following types of glaciers is sometimes called an ice sheet?
   A. valley glacier
   B. continental glacier
   C. Piedmont glacier
   D. ice bergs
   E. none of the above

2. The only two places on Earth that are covered by ice sheets today are:
   A. the north pole and the south pole
   B. Greenland and Iceland
   C. Alaska and Antarctica
   D. Antarctica and Greenland
   E. Siberia and Antarctica

3. Most accumulation on a glacier occurs (1) ______ whereas most ablation occurs (2) ______.
   A. (1) at night (2) during the day
   B. (1) when the glacial budget is negative (2) when the glacier recedes
   C. (1) in the zone of wastage (2) at the head of the glacier
   D. (1) at the head of the glacier (2) near the front of the glacier
   E. (1) during interglacial periods (2) during ice ages

4. The process of creep in a glacier results from ice crystals sliding over each other along planes of weakness in the ice. This type of motion of the glacier is also called:
   A. internal flow
   B. basal sliding
   C. crevassing
   D. surging
   E. creepification

5. Which of the following glacial features is an erosional feature that is created by the glacial process called plucking?
   A. U-shaped valley
   B. drumlin
   C. arête
   D. fjord
   E. roche moutonnée

6. What is a cirque?
   A. a bowl-shaped depression on a mountain carved out by a valley glacier
   B. a pyramidal mountain peak in a glacially eroded region
   C. a knife-like ridge of rock between two glacially eroded valleys
   D. a U-shaped tributary valley that sits high above a deeper valley
   E. a small lake in a depression eroded out by a glacier long ago
7. Which of the following depositional features is best described by the definition: “Rounded hills of till, shaped like inverted teaspoons, with the steep side facing the direction the glacier came from.”
   A. erratic
   B. esker
   C. kame
   D. varve
   **E. drumlín**

8. How often were there major lows in global temperatures during the Pleistocene ice age?
   A. every 1000 years
   B. every 10,000 years
   C. every 10,000 – 20,000 years
   D. every 20,000 – 40,000 years
   **E. every 100,000 years**

9. Which of the following statements about ice ages is FALSE?
   A. the last ice age ended about 10,000 years ago
   B. ice ages are caused by Milankovitch cycles
   C. sea level has risen by about 130m since the end of the last ice age
   D. the Sahara desert had a warm and wet climate during the last ice age
   **E. almost the entire planet was covered by ice during the last ice age**

10. _______ is an example of a *pluvial lake* that formed during the last ice age at quite a large distance away from edge of the ice sheet, in current-day Utah.
    A. Lake Missoula
    B. **Lake Bonneville**
    C. Great Salt Lake
    D. Lake Chad
    E. Lake Placid

11. _______ is an example of a *proglacial lake* that broke through its ice dam near the end of the ice age, forming the scablands of Eastern Washington during to the resultant flood.
    A. Lake Missoula
    B. Lake Bonneville
    C. Great Salt Lake
    D. Lake Chad
    **E. Lake Placid**

12. The two factors that are hypothesized to produce Milankovitch cycles are:
    A. greenhouse gases and chlorofluorocarbons
    B. global warming and ice ages
    C. **eccentricity and precession**
    D. meteorite impacts and volcanic eruptions
    E. oddity and obsession

13. Any geologic process that involves the action of the wind is called a/an:
    A. meteorological process
    B. deflation process
    C. **eolian process**
    D. thespian process
    E. loessian process
14. The process whereby small grains of sediment bounce along the ground driven by the wind is called:
   A. surface creep
   B. bed load
   C. deflation
   **D. saltation**
   E. the samba

15. The process of abrasion can cause rocks on the desert floor to develop several polished faces so that they look like big gemstones with facets. These rocks are called:
   A. artifacts
   B. yardangs
   C. blowouts
   D. desert pavements
   **E. ventifacts**

16. In a sand dune, the shallow side is the (1) _______ and the steep side is the (2) _______.
   A. (1) slip face (2) angle of repose
   B. (1) leeward slope (2) windward slope
   **C. (1) windward slope (2) leeward slope**
   D. (1) leeward slope (2) slip face
   E. none of the above

17. The type of sand dunes that form ridges aligned perpendicular to the prevailing wind direction and which result in the development of “sand seas” are:
   A. barchan dunes
   B. longitudinal dunes
   **C. transverse dunes**
   D. parabolic dunes
   E. star dunes

18. The horns of a (1) _______ dune point towards the direction the wind blows **towards**, whereas in a (2) _______ dune they point in the direction the wind is blowing **from**.
   A. (1) transverse (2) longitudinal
   B. (1) barchan (2) barchanoid
   **C. (1) barchan (2) parabolic**
   D. (1) parabolic (2) star
   E. (1) parabolic (2) barchan

19. The **salinity** of the ocean is in the range:
   A. 33 - 37 percent
   **B. 33 - 37 parts per thousand**
   C. 33 - 37 parts per gallon
   D. 33 - 37 parts per kilogram
   E. 33 - 37 parts per year

20. Which of the following processes causes an **increase** in ocean salinity?
   A. evaporation
   B. biological processes
   C. river inflow
   D. precipitation
   E. meteorite impact
21. Ocean currents are driven by (1) _______ and reach a depth of about (2) _______.
   A. (1) wind   (2) 10m
   B. (1) wind   (2) 100m
   C. (1) wind   (2) 200m
   D. (1) waves   (2) 100m
   E. (1) waves   (2) 200m

22. The most dominant control on Earth’s tides is:
   A. the Moon
   B. the Sun
   C. the Earth
   D. El Niño
   E. silly Pluto

23. The greatest tidal range on Earth can be found at:
   A. Puget Sound, Washington
   B. Bay of Fundy, Nova Scotia
   C. estuaries all around the Earth
   D. San Francisco Bay, California
   E. Gulf of Mexico, Texas

24. Which of the following features does not necessarily result from longshore drift?
   A. barrier islands
   B. spits
   C. beaches
   D. baymouth bars
   E. recurved spits

25. If a coastal resort community built a number of groins along a north-south oriented shoreline, and the beach sand was being eroded from the north side of the groins and being deposited along the south side of the groins, then:
   A. the longshore drift direction is from north to south
   B. the longshore drift direction is from south to north
   C. the longshore drift direction is from east to west
   D. the longshore drift direction is from west to east
   E. the longshore drift direction is from left to right

26. The three types of erosive processes along shorelines are:
   A. abrasion, corrosion, hydraulic action
   B. abrasion, saltation, hydrologic action
   C. erosion, deposition, abrasion
   D. sea cliffs, wave-cut platforms, headlands
   E. longshore currents, waves, tides

27. A relative drop in sea level can cause flat areas of once submerged land to be exposed along coastal areas. These flat areas can be several meters above sea level and are called:
   A. marine terraces
   B. wave-cut platforms
   C. wave-built platforms
   D. sea cliffs
   E. submerged coastlines
28. Which of the following is arranged in the correct order of development?
   A. sea arch, sea stack, sea cave
   B. sea cave, sea arch, sea stack
   C. sea arch, sea cave, sea stack
   D. sea stack, sea arch, sea cave
   E. sea cave, sea stack, see another cave

29. Sea level drop during an ice age results in a/an (1) ____________ coastline. Tectonic uplift of
    the land results in a/an (2) ____________ coastline.
   A. (1) emergent  (2) submergent
   B. (1) submergent  (2) emergent
   C. (1) submergent  (2) submergent
   D. (1) emergent  (2) emergent
   E. none of the above

30. An example of a **renewable** resource is:
   A. groundwater
   B. oil
   C. gold
   D. coal
   E. **wind**

31. Which of the following resources is **NOT** a fossil fuel?
   A. oil shales
   B. **uranium-235**
   C. coal
   D. hydrocarbons
   E. natural gas

32. The correct sequence of events during the process of **coalification** is:
   A. peat - bituminous coal - lignite - anthracite
   B. lignite - peat - bituminous coal - anthracite
   C. anthracite - lignite - bituminous coal - peat
   D. **peat - lignite - bituminous coal - anthracite**
   E. bituminous coal - lignite - anthracite - peat

33. What type of energy can be harnessed using **photovoltaic cells**?
   A. **solar**
   B. wind
   C. tidal
   D. hydroelectric
   E. geothermal

34. The best alternative to fossil fuels for supplying all of society’s needs is:
   A. solar energy
   B. **nuclear energy**
   C. biomass energy
   D. hydroelectric energy
   E. geothermal energy
35. Which of the following statements about nuclear power is **TRUE**?
   A. nuclear power is less efficient than oil for generating energy
   **B. nuclear power plants utilize uranium fission reactions to generate power**
   C. nuclear power is a renewable resource
   D. nuclear power supplies about 50% of the world's energy needs
   E. nuclear power is great because there are no environmental concerns

36. Which of the following is always going to be a geologic **risk**?
   A. an earthquake
   B. a volcanic eruption
   C. a landslide
   D. a tsunami
   **E. none of the above**

37. Which of the following is **NOT** an example of a rapid onset hazard?
   A. meteorite impact
   B. flash flood
   **C. slump**
   D. tsunami
   E. earthquake

38. Which of the following actions is **NOT** considered to be a part of a geologic hazard assessment?
   A. creating a geologic hazard map
   B. determining the history of a particular type of geologic hazard in a region
   C. determining what the hazard would be like if it were to happen today
   D. determining how often the hazard is likely to occur
   **E. determining how many people would be affected by the hazard**

39. Which of the following statements about the solar system is **FALSE**?:
   A. all planets except Pluto revolve around the Sun in the plane of the ecliptic
   B. Uranus is the only planet with a rotational axis pointing towards the Sun
   C. the asteroid belt occurs between the planets Mars and Jupiter
   **D. all planets rotate in a counterclockwise direction when viewed from above**
   E. the Terrestrial planets consist of Mercury, Venus, Earth, and Mars

40. Which of the following is **NOT** one of the Jovian planets:
   A. Jupiter
   B. Saturn
   C. Uranus
   D. Neptune
   **E. Pluto**

41. A piece of space debris that enters the Earth's atmosphere is called a (1) _______ but if it hits the ground it is called a (2) _________.
   A. (1) asteroid (2) meteorite
   B. (1) comet (2) meteorite
   C. (1) meteor (2) fireball
   **D. (1) meteor (2) meteorite**
   E. (1) meteorite (2) meteor
42. The meteorite impact that caused the extinction of the dinosaurs was the Chicxulub meteorite that hit the (1) ______ about (2) ______ years ago.
   A. (1) Arizona desert, USA (2) 49,000
   B. (1) Arizona desert, USA (2) 66 million
   C. (1) Yucatan Peninsula, Mexico (2) 66 million
   D. (1) Yucatan Peninsula, Mexico (2) 49,000
   E. (1) Tunguska region, Siberia (2) 66 million

43. We see evidence for the Chicxulub impact event in thin layers of sediment that are enriched in the element ____________, which is only common in meteorites.
   A. calcium
   B. nickel
   C. iridium
   D. uranium
   E. einsteinium

44. The largest meteorite impact crater, the largest volcano, and the largest rift valley in the solar system can all be found on:
   A. Mercury
   B. Mars
   C. Venus
   D. Io
   E. Earth

45. The planet that is closest in size to Earth is:
   A. Mercury
   B. Mars
   C. Venus
   D. Jupiter
   E. Pluto

46. The only three volcanically active bodies in the solar system today are:
   A. Earth, Io, and Triton
   B. Earth, Io, and Europa
   C. Earth, Mars, and Io
   D. Earth, Mars, and Europa
   E. Earth, Mars, and Venus

47. The major components of the atmosphere when Earth first formed were:
   A. oxygen, nitrogen, and argon
   B. oxygen, nitrogen, and water vapor
   C. water vapor, carbon dioxide, and nitrogen
   D. water vapor, nitrogen, and sulfur
   E. nitrogen, carbon dioxide, and hydrochloric acid

48. Which of the following statements accurately accounts for why there were no advanced lifeforms on Earth early in its geologic history?
   A. initially the atmosphere was inhospitable for life
   B. oxygen was not abundant in the atmosphere until about 2 billion years ago
   C. eukaryotic cells could not develop until enough O was present
   D. prokaryotic bacteria first needed to create oxygen through photosynthesis
   E. all of the above
49. The most likely process responsible for creating most of the oxygen in the atmosphere was:
   A. meteorite impacts
   B. **photosynthesis by cyanobacteria**
   C. breakdown of water vapor by ultraviolet radiation
   D. the formation of limestone
   E. outgassing during volcanic eruptions

50. The explosion of advanced life forms on Earth happened at the start of the:
   A. **Cambrian Period**
   B. Carboniferous Period
   C. Hadean Eon
   D. Holocene Epoch
   E. Jurassic Period

**BONUS QUESTIONS**

51. Which of the following is an example of a continental interior desert?
   A. Sahara
   B. Namib
   C. Antarctica
   D. **Gobi**
   E. Great Australian

52. What city in Idaho offers the cheapest electricity because of its use of hydroelectric power?
   A. Moscow
   B. Boise
   C. Pocatello
   D. **Idaho Falls**
   E. Coeur d’Alene

53. Which of the following examples constitutes the GREATEST geologic risk?
   A. a tsunami along the coastline of the Pacific Northwest
   B. a backcountry forest during peak fire season
   C. a volcanic eruption on an uninhabited volcanic island
   D. a magnitude 7.9 earthquake in central Alaska
   E. an avalanche in central Greenland

54. If you were hiking across the Hellas Basin, you would be on:
   A. Earth
   B. Venus
   C. **Mars**
   D. Io
   E. Europa

55. The current oxygen content of the atmosphere is:
   A. 0%
   B. 3%
   C. 15%
   D. **21%**
   E. 50%