1) The Himalaya Mountains are located along a portion of the southern boundary of the Eurasian Plate. At the top of Mt. Everest (29,028 feet) in the Himalaya Mountains, climbers have found fossilized marine shells in the surface bedrock. From this observation, which statement is the best inference about the origin of the Himalaya Mountains?

A) Sea level has been lowered more than 29,000 feet since the shells were fossilized.
B) The bedrock containing the fossil shells is part of an uplifted seafloor.
C) The Himalaya Mountains were formed by volcanic activity.
D) The Himalaya Mountains formed at a divergent plate boundary.

2) In which New York State landscape region is Niagara Falls located?

A) Tug Hill Plateau  
B) Allegheny Plateau  
C) St. Lawrence Lowlands  
D) Erie-Ontario Lowlands

3) Buffalo, New York, and Plattsburgh, New York, are both located in landscape regions called

A) plateaus  
B) lowlands  
C) mountains  
D) highlands

4) At which latitude and longitude in New York State would a salt mine in Silurian-age bedrock most likely be located?

A) 44°N 74°W  
B) 43°N 77°W  
C) 41°N 72°W  
D) 44°N 76°W

5) The block diagram below represents a deeply eroded dome. Which of the following maps shows the stream drainage pattern that would most likely develop on this deeply eroded dome?

A)  
B)  
C)  
D)
Questions 6 and 7 refer to the following:

The geologic cross section below represents the bedrock structure beneath four landscape regions, A, B, C, and D.

![Geologic Cross Section Diagram]

The table below shows characteristics of the four landscape regions A, B, C, and D.

<table>
<thead>
<tr>
<th>Landscape Region</th>
<th>Relief</th>
<th>Bedrock</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>great relief, high peaks, deep valleys</td>
<td>faulted and tilted structure; many bedrock types, including igneous</td>
</tr>
<tr>
<td>B</td>
<td>moderate relief, rounded peaks, wide valleys</td>
<td>folded sedimentary bedrock</td>
</tr>
<tr>
<td>C</td>
<td>moderate to high relief</td>
<td>horizontal sedimentary bedrock layers</td>
</tr>
<tr>
<td>D</td>
<td>very little relief, low elevations</td>
<td>horizontal sedimentary bedrock layers</td>
</tr>
</tbody>
</table>

6) Which terms best describe the surface landscapes of A, B, C, and D in the given diagram?
   A) A ‡‡ ridges and valleys, B ‡‡ plateau, C ‡‡ plain, D ‡‡ mountains
   B) A ‡‡ mountains, B ‡‡ ridges and valleys, C ‡‡ plateau, D ‡‡ plain
   C) A ‡‡ plateau, B ‡‡ plain, C ‡‡ mountains, D ‡‡ ridges and valleys
   D) A ‡‡ plain, B ‡‡ mountains, C ‡‡ ridges and valleys, D ‡‡ plateau

7) The sharp, angular flat-topped hills (mesas) in landscape region C in the given diagram were most likely produced by a climate that was
   A) humid          B) dry              C) tropical        D) polar

8) The list below shows characteristics that vary from place to place on Earth.
   (a) Radioactive substances
   (b) Bedrock structures
   (c) Duration of insolation
   (d) Hillslopes
   (e) Stream patterns
   (f) Atmospheric composition

Observations and measurements of which three characteristics would be most useful in describing landscapes?
   A) b, c, and f         B) b, d, and e         C) d, e, and f         D) a, b, and c
9) The sequence of bedrock cross sections below represents the same landscape region over a period of geologic time.

![Cross sections showing landscape evolution](image)

This sequence best represents
A) a humid region that experienced mostly erosional forces
B) a humid region that experienced mostly uplifting forces
C) an arid region that experienced mostly erosional forces
D) an arid region that experienced mostly uplifting forces

10) The cross section below shows rock layers that underwent crustal movement during an igneous intrusion in the Cretaceous Period.

![Cross section showing igneous intrusion and ridges](image)

Which statement best describes the cause of the ridges shown?
A) The igneous intrusion flowed over the surface.
B) More deposition occurred at the ridge sites after uplift.
C) Some rock layers were more resistant to weathering and erosion.
D) The rock layers were evenly weathered.
11) Points A, B, C, X, and Y are locations on the topographic map below. The small map identifies the New York State region shown in the topographic map.

At the end of the Ice Age, the valley now occupied by Cayuta Creek was a channel for southward flowing glacial meltwater. Into which present-day river valley did this meltwater most likely flow?

A) Genesee River  
B) Hudson River  
C) Susquehanna River  
D) Delaware River

12) The shore of which New York State body of water has large amounts of metamorphic bedrock exposed at the surface?

A) southern shore of Lake Ontario  
B) eastern shore of Lake Erie  
C) southern shore of Long Island Sound  
D) western shore of Lake Champlain
13) The map below shows most of New York State. Isolines indicate the depth of the Precambrian bedrock surface below present-day sea level. Depths are in feet.

According to the map, in which two present-day New York State landscape regions is the most Precambrian bedrock likely to be exposed on the land surface?
A) Adirondack Mountains and Hudson Highlands
B) Hudson-Mohawk Lowlands and Champlain Lowlands
C) Erie-Ontario Lowlands and Tug Hill Plateau
D) Allegheny Plateau and Catskills

14) The graph below shows the average change in the elevation of a mountain range over time.

According to the graph, the rate of uplifting was greater than the rate of erosion during which geologic time period?
A) Carboniferous
B) Devonian
C) Silurian
D) Permian
15) What is the age of the most abundant surface bedrock in the Finger Lakes region of New York State?
   A) Pennsylvanian  
   B) Permian  
   C) Cambrian  
   D) Devonian

Questions 16 through 18 refer to the following:

The map below shows watershed regions of New York State.

16) On which type of landscape region are both the Susquehanna-Chesapeake and the Delaware watersheds located?
   A) mountain  
   B) plateau  
   C) lowland  
   D) plain

17) Most of the surface bedrock of the Ontario-St. Lawrence watershed was formed during which geologic time periods?
   A) Triassic, Jurassic, and Cretaceous  
   B) Mississippian, Pennsylvanian, and Permian  
   C) Precambrian and Cambrian  
   D) Ordovician, Silurian, and Devonian

18) In which watershed is the Genesee River located?
   A) Delaware  
   B) Ontario-St. Lawrence  
   C) Susquehanna-Chesapeake  
   D) Mohawk-Hudson

19) In what New York State landscape region is surface bedrock generally composed of metamorphic rock?
   A) Tug Hill Plateau  
   B) Adirondack Mountains  
   C) Newark Lowlands  
   D) the Catskills
20) The photograph below shows an outcrop of sedimentary rock layers that have been tilted and slightly metamorphosed.

![Photo of tilted rock layers](image)

Tilted, slightly metamorphosed rock layers such as these are typically found in which New York State landscape region?

A) Erie-Ontario Lowlands  
B) Tug Hill Plateau  
C) Atlantic Coastal Plain  
D) Taconic Mountains

21) Which two locations are in the same New York State landscape region?

A) Albany and Old Forge  
B) Binghamton and New York City  
C) Jamestown and Ithaca  
D) Massena and Mt. Marcy

22) The geologic cross section below shows a hill-slope and the rock layers that underlie it.

![Geologic cross section](image)

Which difference between the sandstone, shale, and limestone layers caused the formation of the relatively gently sloped section labeled "bench"?

A) amount of uranium-238  
B) resistance to weathering  
C) rock age  
D) fossil content
23) Surface bedrock of the Allegheny Plateau is most likely to contain fossils of the earliest
A) dinosaurs  
B) flowering plants  
C) grasses  
D) amphibians

24) The photograph below shows an outcrop of horizontal rock layers in New York State.

Rock outcrops like this are most commonly found in which area of New York State?
A) Adirondack Mountains  
B) Atlantic Coastal Plain  
C) Hudson Highlands  
D) Appalachian Plateau

25) The diagram below shows the bedrock structure beneath a series of hills.

Which process was primarily responsible for forming the hills?
A) deposition  
B) vulcanism  
C) faulting  
D) folding
26) The map below shows the stream drainage patterns for a region of Earth's surface. Points A, B, C, and D are locations in the region.

The *highest* elevation most likely exists at point

A) A B) B C) C D) D

27) Which stream-drainage pattern most likely developed on the surface of a newly formed volcanic mountain?

A) B) C) D)

28) A list of three observed relationships is shown below.

- Erosional rate = depositional rate
- Amount of insolation = amount of terrestrial radiation
- Rate of condensation = rate of evaporation

In which situation would each relationship exist?

A) when a cyclic change occurs  
B) when dynamic equilibrium is reached  
C) when a change of state occurs  
D) when global warming ceases and global cooling begins

29) Large garnet mineral crystals are found in the metamorphic surface bedrock in which New York State landscape region?

A) Catskills B) Adirondacks C) Tug Hill Plateau D) Erie-Ontario Lowlands

30) Which New York State river flows generally southward?

A) St. Lawrence River B) Niagara River C) Hudson River D) Genesee River
31) Outwash plains are formed as a result of deposition by
A) landslides C) winds from hurricanes 
B) ocean waves D) meltwater from glaciers

32) The graph below shows the change in carbon dioxide concentration in parts per million (ppm) in Earth's atmosphere from 1960 to 1990.

![Graph showing carbon dioxide concentration from 1960 to 1990.]

The most likely cause of the overall change in the level of carbon dioxide from 1960 to 1990 is an increase in the
A) use of nuclear power C) number of violent storms
B) use of fossil fuels D) number of volcanic eruptions

33) Fossilized footprints of *Coelophysis* dinosaurs have been found in bedrock closest to which New York State location?
A) Watertown C) Old Forge
B) New York City D) Niagara Falls

34) In which New York State landscape region is most of the surface bedrock composed of metamorphic rock?
A) Erie-Ontario Lowlands C) Catskills
B) Newark Lowlands D) Adirondacks

35) An environmental scientist needs to prepare a report on the potential effects that a proposed surface mine in New York State will have on the watershed where the mine will be located. In which reference materials will the scientist find the most useful data with which to determine the watershed's boundaries?
A) geologic time scales C) topographic maps
B) planetary wind maps D) tectonic plate maps

36) Which river is a tributary branch of the Hudson River?
A) Mohawk River C) Delaware River
B) Susquehanna River D) Genesee River
37) The geologic cross section below shows a view of rock layers at Earth's surface. The dashed lines connect points of the same age. Major fossils contained within each rock layer are shown. The valleys are labeled X, Y, and Z.

In this region, valley X is more deeply eroded than either valley Y or valley Z. The most likely explanation for this occurrence is that the metamorphic rock near X has been
A) weakened by faulting
B) folded by pressure
C) intruded by melted rock
D) covered by sedimentary rocks

38) Each dot on the graph below shows the result of separate scientific studies of the relationship between the rates of erosion in regions of different relief. Relief is the local difference between the highest and the lowest elevations.

The results of these combined studies indicate that with each 100-meter increase in relief, the rate of erosion generally
A) decreases at a rate of 10 cm/1,000 years
B) increases at a rate of 20 cm/1,000 years
C) increases at a rate of 10 cm/1,000 years
D) decreases at a rate of 20 cm/1,000 years
39) The topographic map below shows a particular landscape.

Which map *best* represents the stream drainage pattern for this landscape?

A)  
B)  
C)  
D)  

40) The photograph below shows an eroded plateau found in the southwestern United States.

Which processes most likely developed this landscape?
A) crustal uplift and glacial erosion  
B) crustal uplift and stream erosion  
C) crustal folding and stream erosion  
D) crustal folding and glacial erosion  

41) The map below shows major streams in the New York State area. The bold lines mark off sections A through I within New York State.

What would be the best title for this map?
A) "Landscape Regions of New York State"
B) "Tectonic Plate Boundaries in New York State"
C) "Watershed Areas of New York State"
D) "Bedrock Geology Locations of New York State"

42) The diagram below represents a map view of a stream drainage pattern.

Which underlying bedrock structure most likely produced this stream drainage pattern?
A) C) D)
43) The cross section below shows sedimentary rocks being eroded by water at a waterfall.

The sedimentary rock layers are being weathered and eroded at different rates primarily because the rock layers
A) contain different fossils
B) are horizontal
C) formed during different time periods
D) have different compositions

44) Landscapes with horizontal bedrock structure, steep slopes, and high elevations are classified as
A) lowland regions
B) plain regions
C) plateau regions
D) mountain regions

45) Which two New York State landscape regions are formed mostly of surface bedrock that is approximately the same geologic age?
A) Tug Hill Plateau and St. Lawrence Lowlands
B) Adirondack Mountains and Allegheny Plateau
C) Erie-Ontario Lowlands and Adirondack Mountains
D) Manhattan Prong and Atlantic Coastal Plain

46) The table below describes the characteristics of three landscape regions, A, B, and C, found in the United States.

<table>
<thead>
<tr>
<th>Landscape</th>
<th>Bedrock</th>
<th>Elevation/Slopes</th>
<th>Streams</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Faulted and folded gneiss and schist</td>
<td>High elevation Steep slopes</td>
<td>High velocity Rapids</td>
</tr>
<tr>
<td>B</td>
<td>Layers of sandstone and shale</td>
<td>Low elevation Gentle slopes</td>
<td>Low velocity Meanders</td>
</tr>
<tr>
<td>C</td>
<td>Thick horizontal layers of basalt</td>
<td>Medium elevation Steep to gentle slopes</td>
<td>High to low velocity Rapids and meanders</td>
</tr>
</tbody>
</table>

Which list best identifies landscapes A, B, and C?
A) A ‡‡ plain, B ‡‡ mountain, C ‡‡ plateau
B) A ‡‡ plain, B ‡‡ plateau, C ‡‡ mountain
C) A ‡‡ plateau, B ‡‡ mountain, C ‡‡ plain
D) A ‡‡ mountain, B ‡‡ plain, C ‡‡ plateau