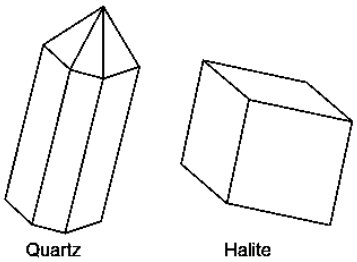
Earth Science January Exam 2018 -TAN EXAM No Corrections

Please PRINT your name, school, area, and which test you are taking onto the scantron. Choose the answer that best completes the statements or questions below and fill in the appropriate response on the scantron. If you change your answer, be sure to completely erase your first choice. Diagrams are not drawn to scale unless specified.

1. Quartz and halite have different crystal shapes primarily because:

A) light reflects from crystal surfaces
B) energy is release during crystallization
C) of impurities that produce surface variations
D) of the internal arrangement of the atoms



Using table 1 & 2 below, answer questions 2 & 3 below.

2.Which of the following minerals will scratch all of the others?
A) emerald B) sapphire C) spinel D) zircon

3. Which gemstone minerals contain the two most abundant elements by mass in Earth's crust?
A) emerald and spinel C) emerald and zircon
B) sapphire and spinel D) sapphire and zircon

Table 1

Gemstone Mineral	Composition	Hardness	Average Density (g/cm^3)
emerald	$Be_3Al_2(Si_6O_{18})$	7.5–8	2.7
sapphire	Al_2O_3	9	4.0
spinel	$MgAl_2O_4$	8	3.8
zircon	$ZrSiO_4$	7.5	4.7

KEY	
Al = aluminum	O = oxygen
Be = beryllium	Si = silicon
Mg = magnesium	Zr = zirconium

Table 2

Moh's Scale of Hardness
1 talc
2 gypsum
3 calcite
4 fluorite
5 apatite
6 feldspar
7 quartz
8 topaz
9 corundum
10 diamond

4. Which statement about the formation of a rock is best supported by the rock cycle?
A) Magma must be weathered before it can change to metamorphic rock
B) Sediment must be compacted and cemented before it can change to sedimentary rock
C) Sedimentary rock must melt before it can change to metamorphic rock.
D) Metamorphic rock must melt before it can change to sedimentary rock.

5. Rhyolite has a fine texture and was formed from the cooling of lava. Rhyolite is an example of
A) a mineral C) an igneous rock
B) a sedimentary rock D) a metamorphic rock

6. Nine rock samples were classified into three groups as shown below. The classification system was most likely based on:

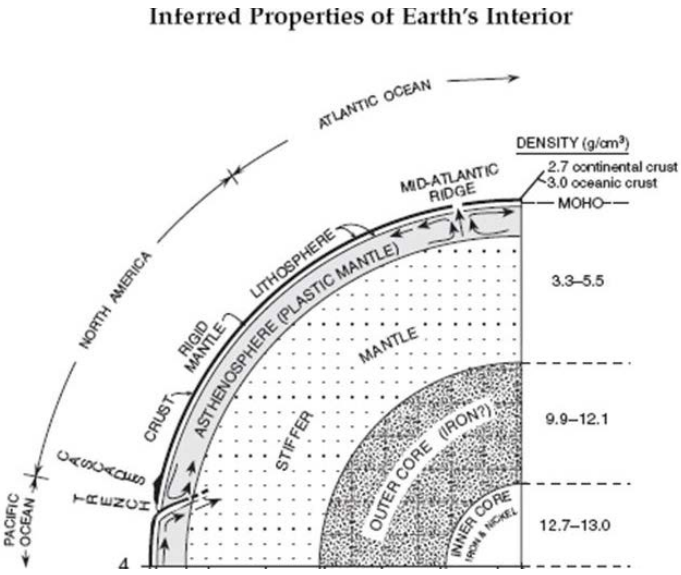
A) way in which the rock formed
B) color of the rock
C) age of the minerals in the rock
D) size of the crystals in the rock

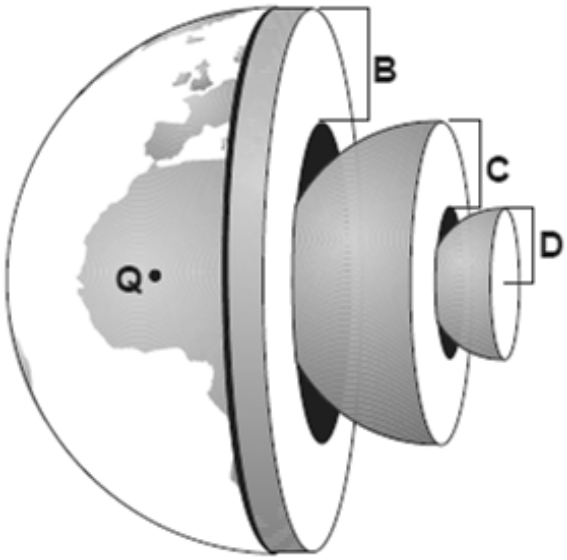
Group A	Group B	Group C
Granite	Shale	Marble
Rhyolite	Sandstone	Schist
Gabbro	Conglomerate	Gneiss

Base your answer to the next 2 questions on the diagram of Earth shown below. Letters B, C, and D represent layers of Earth. Letter Q represents a location on Earth's surface.

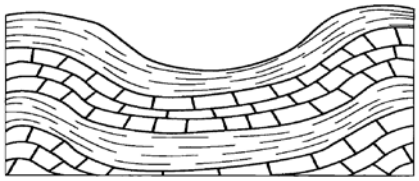
7. What is the probably density of the granitic bedrock at location Q?
A) 1.0 g/cm^3 B) 2.7 g/cm^3 C) 3.0g/cm^3 D) 5.5g/cm^3

8. Which letter best represents the earth's mantle?
A) Q B) B C) C D) D



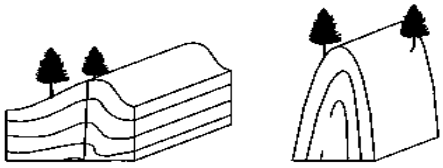


9. The cross section to the right shows a portion of Earth's crust. Which observation provides the most direct evidence that crustal plate collision has occurred near this region?
A) folding B) faulting C) intrusions D) tilting



10. The sedimentary bedrock in both diagrams below originally formed as

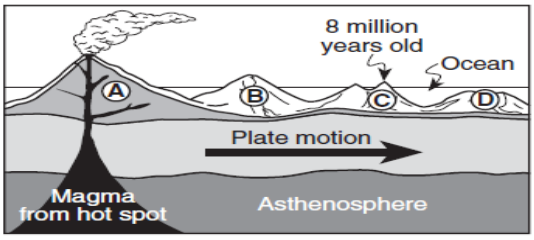
A) recrystallized layers
B) horizontal layers
C) faulted layers
D) folded layers



11. Fossils of marine plants and animals are found in the bedrock of mountains many thousands of feet above sea level. The most likely reason for this observation is that:
A) the mountains were part of a mid-ocean ridge
B) the ocean level has dropped several thousand feet
C) forces within the Earth caused uplift
D) transported materials were deposited at high elevations

12. Recent volcanic activity in different parts of the world supports the inference that volcanoes are located mainly in:
A) the centers of landscape regions
B) the central regions of continents
C) zones of crustal activity
D) zones in the late stages of erosion

Base your answer to questions 13 & 14 on the diagram below.



13. What are the most likely geologic ages of volcanoes B and D in the diagram to the right?
A) B= 5 million years and D=12 million years old
B) B= 2 million years and D=6 million years old
C) B= 9 million years and D=9 million years old
D) B= 10 million years and D=4 million years old

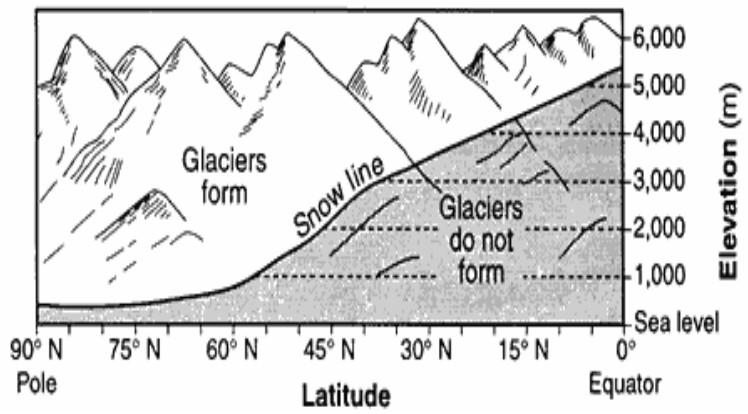
14. Area A most likely formed over where?
A) The East African Rift
B) Nazca Plate
C) San Andreas Fault
D) Hawaiian Hot Spot

15. Which choice below shows the relative plate motion that the continents on opposite sides of the Atlantic Ocean have been doing over the past 200 million years?
A) ➔➔ B) ➔➔ C) ↑↓ D)↙↘

16. The primary cause of convection currents in the Earth's mantle is believed to be the:
A) differences in densities of earth materials
B) subsidence of the crust
C) occurrence of earthquakes
D) rotation of Earth

17. Which is the best evidence supporting the concept of ocean floor spreading?
A) Earthquakes occur at greater depths beneath continents than beneath oceans
B) Sandstone and limestone can be found both in North America and Europe
C) Volcanoes appear at random within the oceanic crust
D) igneous rocks along the mid-ocean ridges are younger than those father from the sides

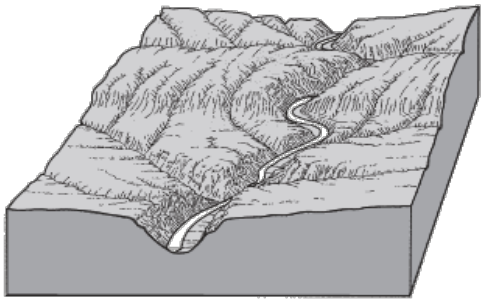
18. Using the diagram below, determine which location would a glacier most likely form?
A) 0° latitude and at an elevation of 6,000m
B) 15° latitude and at an elevation of 4,000m
C) 30° latitude and at an elevation of 3,000m
D) 45° latitude and at an elevation of 1,000m



19. Which landscape characteristic best indicates the action of glaciers?
A) very few lakes
B) horizontal deposits of well-sorted sediments
C) polished and scratched surface bedrock
D) vertically deposits of well-sorted rock

20. A river's current carries sediments into the ocean. Which sediment size will most likely be deposited in deeper water farthest from shore?
A) pebble
B) sand
C) silt
D) clay

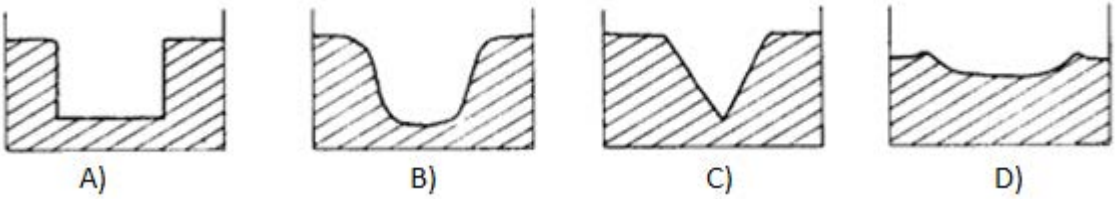
21. A brief, heavy rainstorm occurs in the mountains. How will the volume and rate of erosion in the stream change shortly after the rainstorm?



A) volume will decrease, erosion will increase
B) volume will increase, erosion will decrease
C) both volume and erosion will decrease
D) both volume and erosion will increase

22. The Mississippi River has a meandering course with a very broad valley. The developmental age of the Mississippi River would most likely be classified as:
A) young B) mature C) old D) senile

23. The diagram to the right represents a stream valley. Which diagram below best shows how this valley might be modified after a glacier has moved through it?

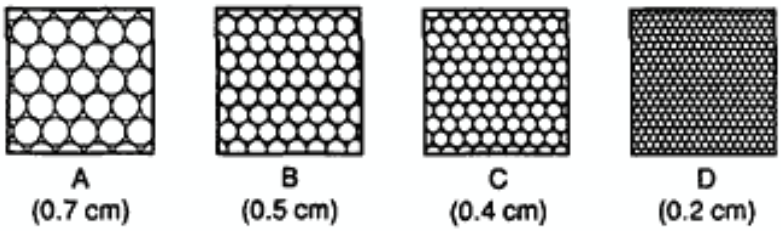


24. Which soil conditions normally result in the greatest amount of runoff?
A) low permeability and gentle slope
B) low permeability and steep slope
C) high permeability and gentle slope
D) high permeability and steep slope

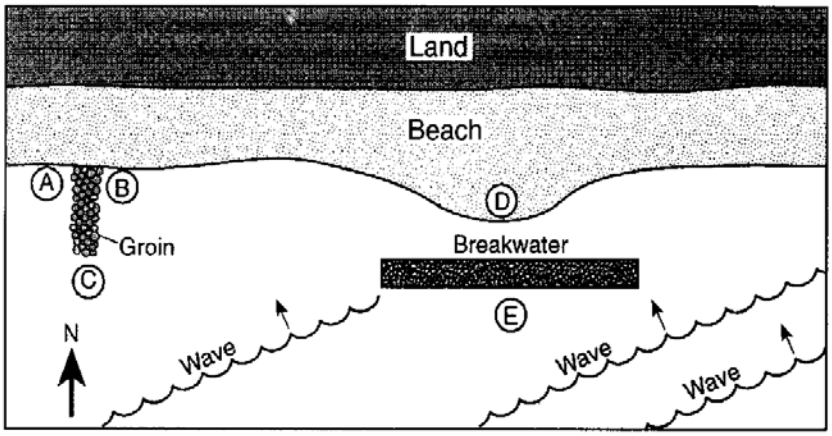
25. Which property of a well-sorted loose material will increase as the particle size decreases?
A) capillarity B) permeability C) porosity D) infiltration

26. Some particles form sample D are mixed with particles from sample A. Compared to the permeability of sample A, the permeability of the resulting mixture will be:

A) less
B) greater
C) the same
D) can't tell



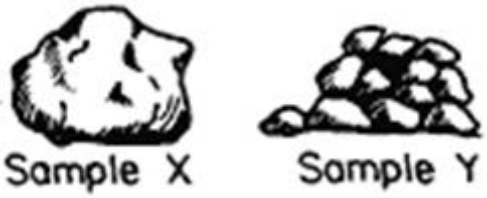
Base your answer to questions 27 & 28 on the diagram below, which shows waves approaching a shoreline. A groin and breakwater have been constructed along the beach. Letters A,B,C,D, and E represent locations in the area.



27. The size of the bulge in the beach at position D will
A) decrease
B) increase
C) remain the same

28. At which location will the beach first begin to widen due to sand deposition?
A) A B) B C) C D) E

29. The weathering rate for sample Y will most likely be:
A) less than X
B) greater than X
C) the same as X

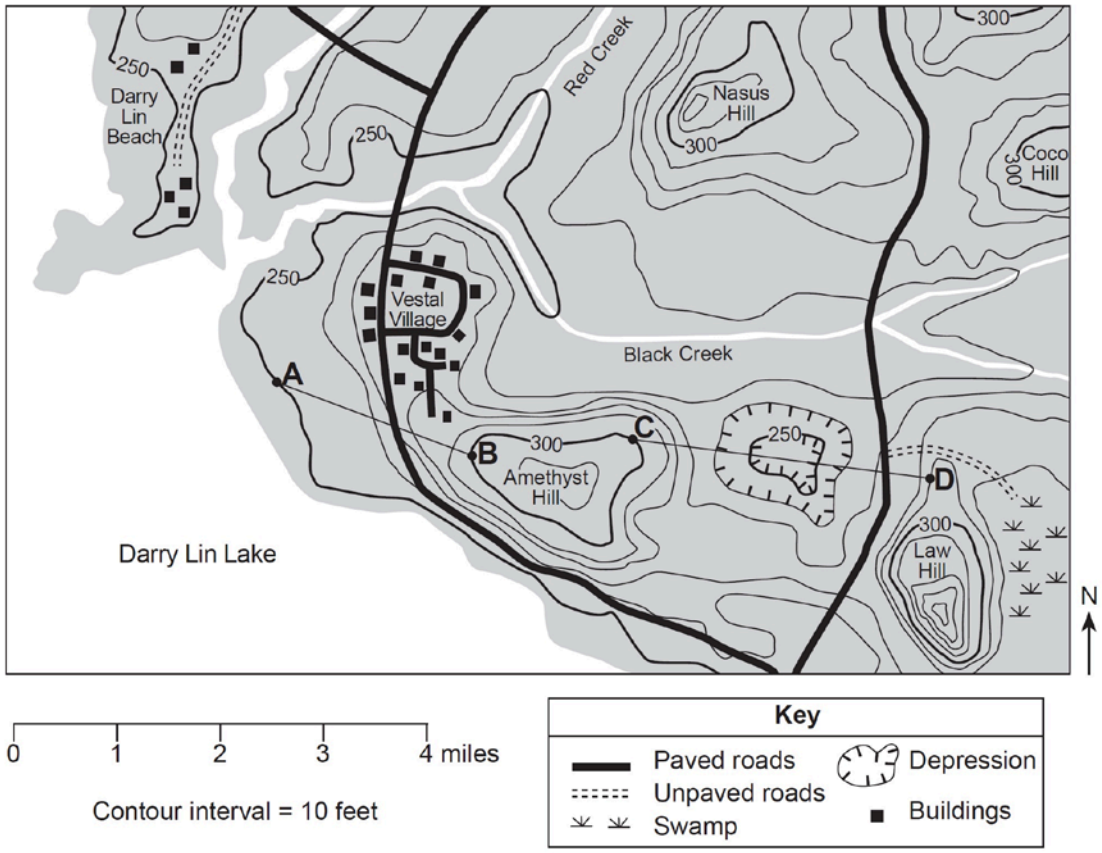


30. Chemical weathering occurs most rapidly in climates which are:
A) dry and warm
B) dry and cold
C) moist and warm
D) moist and cold

31. At high elevations, which is the most common form of physical weathering?
A) abrasion of rocks by the wind
B) oxidation by oxygen in the air
C) dissolving of minerals into solution
D) alternate freezing and melting of water

32. Which quartz sample has probably undergone abrasion in a stream for the longest period of time?

Base your answer to questions 33-36 on the topographic map below and on your knowledge of Earth Science. Points A, B, C, and D represent locations on the surface of Earth. Elevations are measured in feet.

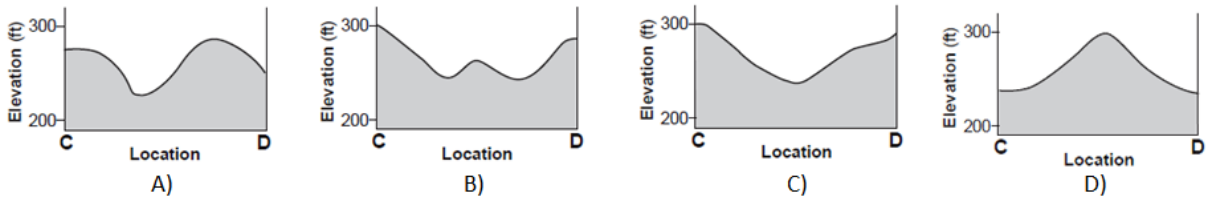


33. What is a possible elevation for the surface of Darry Lin Lake?
A) 228 feet B) 242 feet C) 255 feet D)268 feet

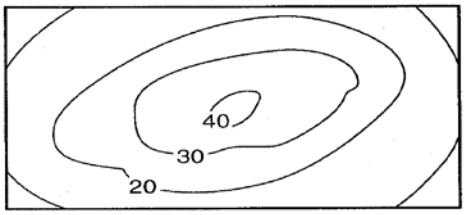
34. What is the approximate gradient form point A to point B on the map?
A) 25 ft/mi B) 50 ft/mi C) 75 ft/mi D)100 ft/mi

35. In which general direction does Red Creek flow?
A) northeast B)northwest C)southeast D)southwest

36. Which cross section represents an accurate profile of the landscape between points C and D?



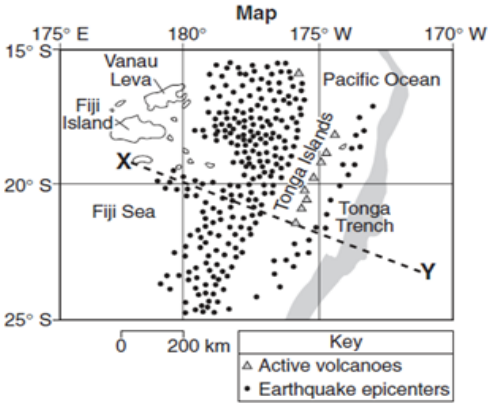
37. Using the diagram to the right, what is the highest possible elevation represented by the contour lines on this map? All elevations are shown in meters.



A) 39 m C) 41 m
B) 49 m D) 51 m

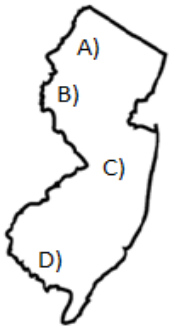
38. Using the diagram to the right, the latitude and longitude of the center of Vanau Leva is closest to:

A) 17°N, 179°W
B) 17°N, 181°W
C) 17°S, 179°E
D) 17°S, 181°E



39. At which map location in New Jersey (to the right), does Polaris appear the lowest in the nighttime sky?

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

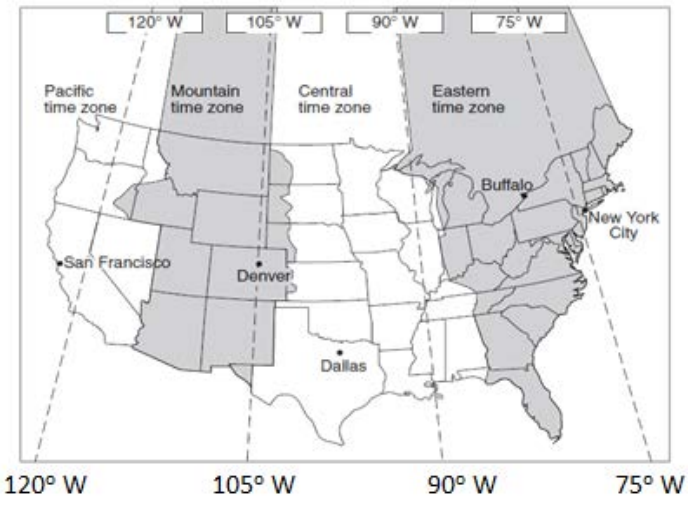


40. Measuring the angular height of the North Star, Polaris, will tell you your locations:
A) longitude
B) latitude
C) zenith
D) azmith

41. Two observers would be experiencing the same apparent solar time if they have:
A) the same latitudes B) the same longitudes C) the same altitude

42. Which location is the **most** due North on Earth?
A) Arctic Circle
B) Antarctic Circle
C) Tropic of Cancer
D) Tropic of Capricorn

Use the map below to answer questions 43, 44.

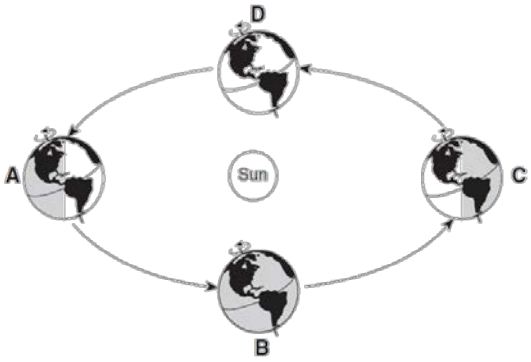


43. If it is 1a.m. in New York City, what time is it in Denver, Colorado?
A) 3am
B) 4am
C) 9pm
D) 11pm

44. Time zones are separated by how many degrees of longitude?
A) 10°
B) 15°
C) 75°
D) 90°

45. Which latitude never receives direct rays of the sun?
A) 0° B) 23.5°N C) 23.5°S D) 66.5°N

Use the diagram below to answer questions 46-48.



46. Which position of Earth represents the first day of summer in New Jersey?
A)A
B)B
C)C
D)D

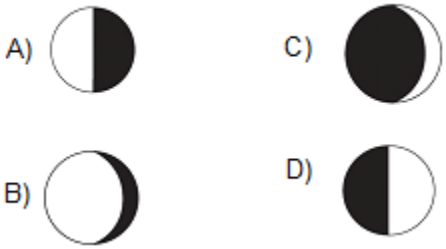
47. When is Earth closest in distance to the sun?
A) A B) B C) C D) D

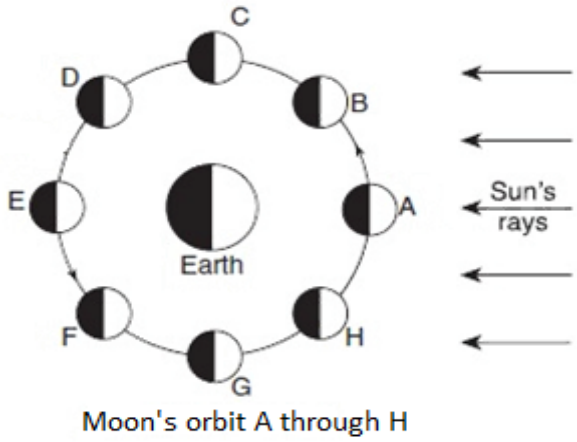
48. What happens to the hours of daylight as we move from position D→A→B?
A) increase only
B) decrease only
C) Increases then decreases
D) decreases then increases

49. Which moon phase appears highest in the sky at midnight to an observer on Earth?
A) full moon B) new moon C) first quarter D) waxing gibbous

50. How many days are required for the moon to go through all of the phases?
A) 24 days B) 27.3 days C) 29.5 days D) 365 days

51. Which moon phase is observed in New Jersey when the moon is located at position F on the diagram below?



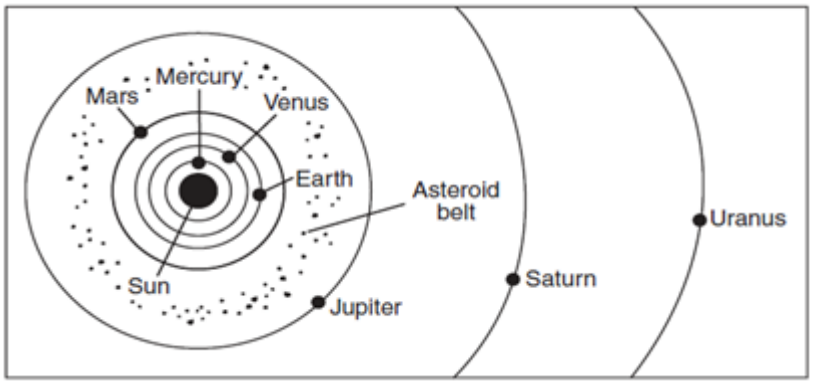


Moon's orbit A through H

52.Using the two diagrams below, determine the average distance, in millions of kilometers, from the Sun to the asteroid belt? Diagrams are not drawn to scale.
A) 129 B) 189 C) 503 D) 85

Data

Planet	Average Distance from Sun (millions of km)
Mercury	58
Venus	108
Earth	150
Mars	228
Jupiter	778
Saturn	1427
Uranus	2869
Neptune	4496



53. As a planet's distance from the Sun increases, what happens to the period of revolution?
A) increases B) decrease C) stays the same

54. Why do stars appear to move through the night sky at a rate of 15°/hr?
A) The Earth actually moves around the sun at a rate of 15°/hr
B) The stars actually move around the center of the galaxy at a rate of 15°/hr
C) The Earth actually rotates at a rate of 15°/hr
D) The stars actually revolve around the Earth at a rate of 15°/hr

55. How would a three hour time exposure photograph of stars in the northern sky appear if Earth did **not** rotate?

56. A red shift in the spectrum of a distant galaxy indicates that the galaxy is:
A) hot C) moving towards us
B) cool D) moving away

57. In which list are celestial features correctly shown in order of increasing size?
A) galaxy → solar system →universe →planet C) planet → solar system → galaxy →universe
B) solar system →galaxy →planet →universe D) universe→ galaxy → solar system → planet

58. Which evidence supports the big bang theory?
A) rate of rotation C) uniform radioactive decay of uranium-238
B) existence of cosmic background radiation D) separation of Earth's interior into different layers

59. Use the diagram below to determine the humidity of air if the dry-bulb temperature is10°C and the wet bulb temperature is 9°C?

A) 13%
B) 4%
C) 88%
D) 179%

Relative Humidity (%)

Dry-Bulb Temperature (°C)	Difference Between Wet-Bulb and Dry-Bulb Temperatures (C°)															
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
−20	100	28														
−18	100	40														
−16	100	48														
−14	100	55	11													
−12	100	61	23													
−10	100	66	33													
−8	100	71	41	13												
−6	100	73	48	20												
−4	100	77	54	32	11											
−2	100	79	58	37	20	1										
0	100	81	63	45	28	11										
2	100	83	67	51	36	20	6									
4	100	85	70	56	42	27	14									
6	100	86	72	59	46	35	22	10								
8	100	87	74	62	51	39	28	17	6							
10	100	88	76	65	54	43	33	24	13	4						
12	100	88	78	67	57	48	38	28	19	10	2					
14	100	89	79	69	60	50	41	33	25	16	8	1				
16	100	90	80	71	62	54	45	37	29	21	14	7	1			
18	100	91	81	72	64	56	48	40	33	26	19	12	6			
20	100	91	82	74	66	58	51	44	36	30	23	17	11	5		
22	100	92	83	75	68	60	53	46	40	33	27	21	15	10	4	
24	100	92	84	76	69	62	55	49	42	36	30	25	20	14	9	4
26	100	92	85	77	70	64	57	51	45	39	34	28	23	18	13	9
28	100	93	86	78	71	65	59	53	47	42	36	31	26	21	17	12
30	100	93	86	79	72	66	61	55	49	44	39	34	29	25	20	16

60. Which weather instrument is used to measure **air temperature** on a weather map?
A) anemometer B) wind vane C) thermometer D) barometer

61) Which area is the most common source region for cold, dry air masses that move over New Jersey State?

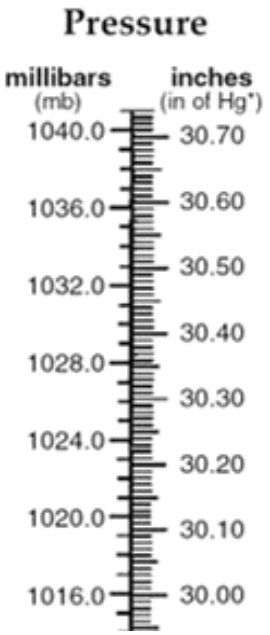
A) North Atlantic Ocean
B) Central Canada
C) Gulf of Mexico
D) Central Mexico

62. An air mass classified at mT (maritime tropical), usually forms over which type of Earth surface?

A) cool land B) cool water C) warm land D) warm water

63. Using the pressure scale to the right, an air pressure of 30.21 inches of mercury is equal to approximately:

A) 1,015 mb
B) 1,017 mb
C) 1,020 mb
D) 1,023 mb



64. As the temperature of the atmosphere at a given location increases, the air pressure will most likely:

A) decrease
B) increase
C) stay the same

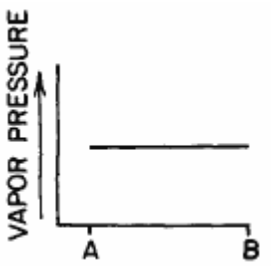
65. The chart below shows the air temperature and dewpoint near the ground at a given location for four consecutive days. All temperatures were recorded at noon. Which statement is best supported by the data?

Day	Air Temperature °C	Dewpoint Temperature °C
1	20	11
2	18	17
3	16	14
4	20	13

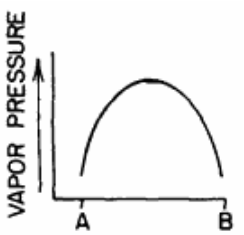
A) Relative humidity was highest on day 1
B) The greatest amount of water vapor was in the atmosphere on day 2
C) The base level cloud formation was highest on day 3
D) The chance of precipitation was greatest on day 4

66. Which graph best represents the amount of moisture from point A to point B in diagram "1.1"?

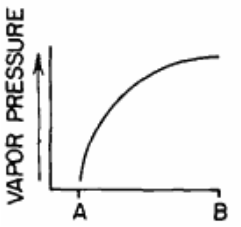
A)



B)



C)



D)

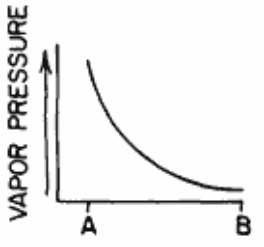
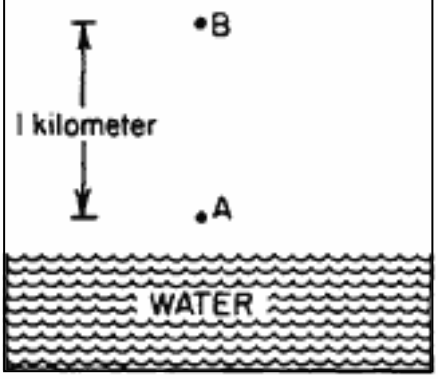
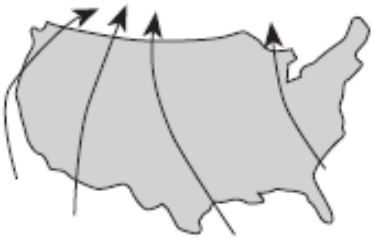


Diagram "1.1"



67. Which map shows normal paths followed by low-pressure centers as they pass across the United States?

A)



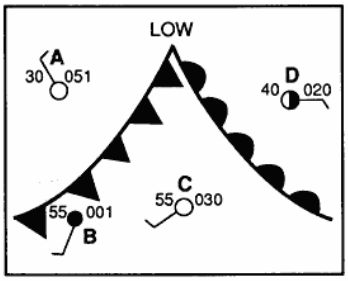
B)

C)

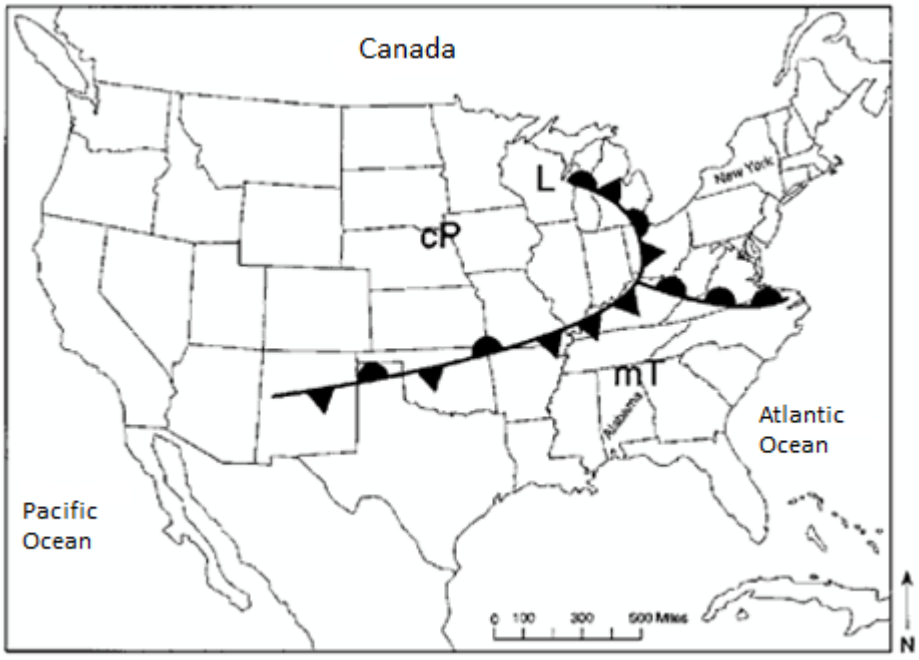
D)

68. Using the weather map to the right, which weather station is probably experiencing unstable weather?

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

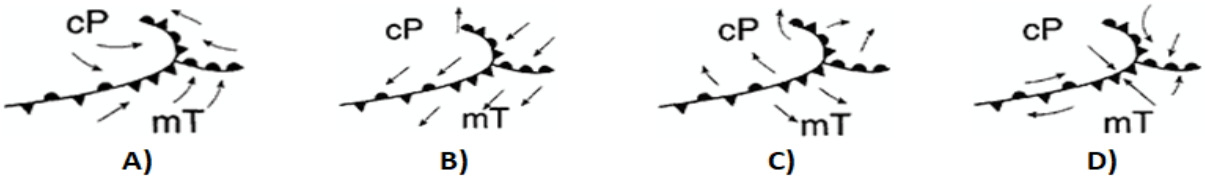


Base your answer to questions 69-71 on the map below, which shows a weather system that is affecting part of the United States.



69. What is the total number of different kinds of weather fronts shown on this weather map?
A) 1
B) 2
C) 3
D) 4

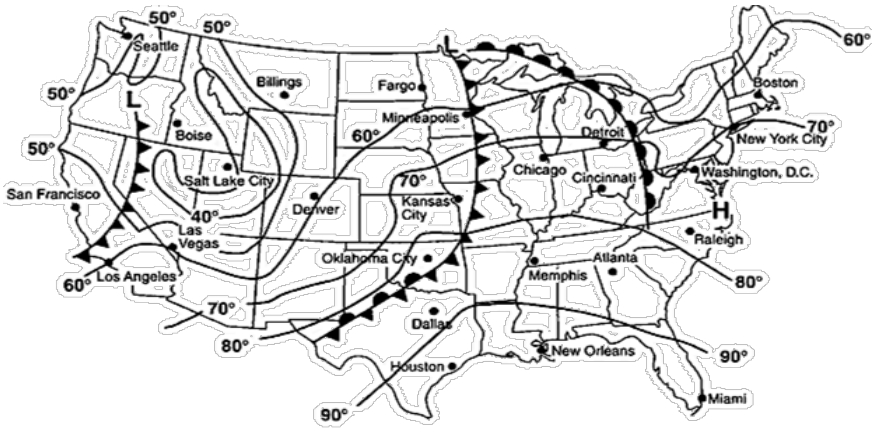
70. Which diagram shows the surface air movements most likely associated with the fronts?



71. Which sequence of events forms the clouds associated with this weather system?
A) Moist air rises and becomes saturated in clean air.
B) Moist air rises, becomes saturated, and condenses on microscopic particles.
C) Moist air falls and reaches the dewpoint in clean air.
D) Moist air falls, reaches the dewpoint, and condenses on microscopic particles.

72. Use the map below, which shows the location of fronts and the temperature field on a given day in the United States. The passage of a cold front most recently influenced the weather of which two cities?

A) Chicago and Boise
B) Las Vegas and Salt Lake City
C) Kansas City and Minneapolis
D) Detroit and Cincinnati



NEW JERSEY SCIENCE LEAGUE

EARTH SCIENCE EXAM ANSWER KEY TAN TEST

DATE: January 11, 2018

1	D	19	C	37	B	55	D
2	B	20	D	38	C	56	D
3	C	21	D	39	D	57	C
4	B	22	C	40	B	58	B
5	C	23	B	41	B	59	C
6	A	24	B	42	A	60	C
7	B	25	A	43	D	61	B
8	B	26	A	44	B	62	D
9	A	27	B	45	D	63	D
10	B	28	B	46	C	64	A
11	C	29	B	47	A	65	B
12	C	30	C	48	D	66	D
13	A	31	D	49	A	67	B
14	D	32	C	50	C	68	B
15	B	33	B	51	B	69	D
16	A	34	A	52	C	70	A
17	D	35	D	53	A	71	B
18	A	36	C	54	C	72	C

Since some earth science courses in New Jersey start with geology, others with astronomy, and still others with meteorology, each of the four tests will include the following topics. Over time, this provides an equal opportunity to everyone. The number in parentheses indicates the approximate number of questions for that topic. The number per topic occasionally varies by one or two, but usually does not.

Geology (Approximately 44 question)

Minerals (4)
Rocks (2)
Earth Structure (2)
Plate Tectonics (4)
Faults/Folds/Seismology (3)
Vulcanism (2)
Glaciation/Deserts (2)
Rivers: Erosion & Deposition (3)
Ground Water/Caves (2)
Ocean Shore Line/Currents/Salinity(3)
Weathering/Mass Wasting (2)
Historical Geology (4)
Map Reading: Road/Topo/Geologic (4)
Geodesics/Time/Map Projections (3)

Astronomy (approximately 14 Questions)

Sun (2)
Moon (2)
Sun-Moon-Earth System (3)
Solar System (3)
Stars (2)
Galactic Systems (2)
Cosmology (2)

Meteorology (Approximately 14 Questions)

Insolation/Temperature/Air Masses (3)
Atmospheric Pressure/Highs/Lows (4)
Moisture in the Atmosphere (3)
Frontal Systems (3)
Interpreting Weather Maps (3)

Dates for 2018 Season

Thursday January 11, 2018 Thursday February 8, 2018
Thursday March 8, 2018 Thursday April 12, 2018
All areas and schools must complete the April exam and mail in the results
by April 28th, 2018

New Jersey Science League
PO Box 65 Stewartsville, NJ 08886-0065
phone # 908-213-8923 fax # 908-213-9391 email: newjsl@ptd.net
Web address: http://entnet.com/~personal/njscil/html/

What is to be mailed back to our office?

PLEASE RETURN THE AREA RECORD AND ALL TEAM MEMBER SCANTRONS
(ALL STUDENTS PLACING 1ST, 2ND, 3RD, AND 4TH).
If you return Scantrons of alternates, then label them as ALTERNATES.

Dates for 2019 Season

Thursday January 10, 2019 Thursday February 7, 2019
Thursday March 7, 2019 Thursday April 11, 2019

Earth Science February Exam 2018 -TAN EXAM Corrections

Please PRINT your name, school, area, and which test you are taking onto the scantron. Choose the answer that best completes the statements or questions below and fill in the appropriate response on the scantron. If you change your answer, be sure to completely erase your first choice. Drawings are not drawn to scale.

1. Which statement is an accurate conclusion based on the information provided in the table?

Rock Sample	Mineral Composition								
	Quartz	Potassium feldspar	Plagioclase feldspar	Biotite	Hornblende	Pyroxene	Olivine	Calcite	Others
Granite	✔	✔	✔	✔	✔				
Rhyolite	✔	✔	✔	✔	✔				
Pumice	✔	✔	✔	✔	✔				
Conglomerate	✔	✔	✔	✔	✔	✔	✔	✔	✔
Slate				✔					✔
Marble								✔	
Limestone								✔	
Basalt			✔		✔	✔	✔		
Gabbro			✔	✔	✔	✔			

Key
✔ = Mineral is present

A) Most rocks are monomineralic
B) All rocks are polymineralic
C) Many rocks have a number of minerals in common
D) Only igneous rocks contain quartz

Table 2

Moh's Scale of Hardness
1 talc
2 gypsum
3 calcite
4 fluorite
5 apatite
6 feldspar
7 quartz
8 topaz
9 corundum
10 diamond

2. Using Table 2 to the right, which mineral will scratch topaz, but not diamond?
A) talc B) feldspar C) quartz D) corundum

3. The relative hardness of a mineral can be tested by
A) scratching the mineral across a glass plate
B) squeezing the mineral with calibrated pliers
C) determining the density of the mineral
D) breaking the mineral with a mineral hammer

4. The physical properties of minerals result from their
A) Density and color
B) Texture and streak
C) Cleavage or fracture
D) Internal arrangement of atoms.

5. Dolostone and limestone both form from the chemical precipitation of seawater. This type of rock formation is an example of
A) a mineral
B) a sedimentary rock
C) an igneous rock
D) a metamorphic rock

6. Eurypterid fossils are abundant in the Bertie dolostone, a rock layer found in western New York State. The presence of both the eurypterids and the dolostone, indicates that, during the formation of this rock layer, this region of New York State was

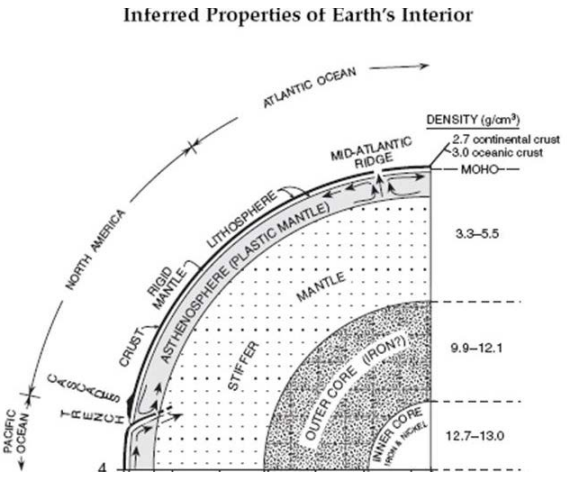
A) uplifted and eroded
B) buried beneath lava flows
C) covered by evaporation shallow seas
D) intensely metamorphosed

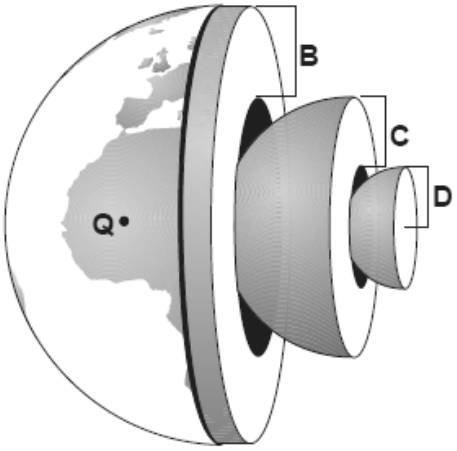
Base your answer to the next 2 questions on the diagram of Earth shown below. Letters B, C, and D represent layers of Earth. Letter Q represents a location on Earth's surface.

7. What material is layer C composed of?

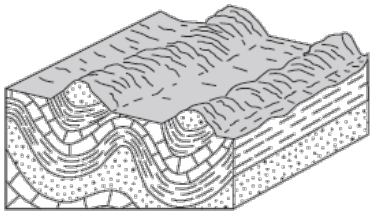
A) granite B) basalt C) solid iron & nickel D) liquid iron & nickel

8. Which letter best represents where the density is approximately 3.7 g/cm^3?
A) Q B) B C) C D) D





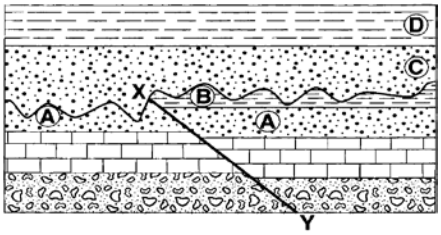
9. The block diagram to the right represents two parallel mountain ranges. Which two geologic processes most likely created this landscape region?



A) volcanism, followed by metamorphism
B) faulting, followed by deposition
C) folding, followed by erosion
D) glaciation, followed by rifting

10. Feature "XY" in the geologic cross section below most likely represents a/(an)

A) unconformity C) intrusion
B) fault D) metamorphism

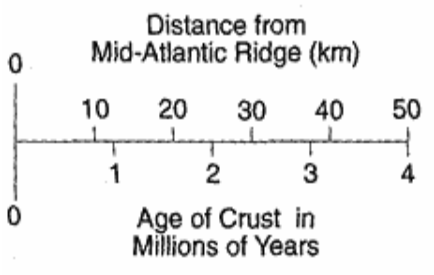


11. Fossils of trilobites and eurypterids found in the rock near the top of Basket Dome provide evidence that this map area has most likely undergone
A) the mountains were part of a mid-ocean ridge
B) the ocean level has dropped several thousand feet
C) volcanism from the seafloor spreading
D) uplift from crustal plate movement

12. A large belt of mountain ranges and volcanoes surrounds the Pacific Ocean. Which events are closely associated with these mountains and volcanoes?
A) earthquakes C) sandstorms
B) hurricanes D) tornadoes

13. Which statement best supports the theory that all the continents were once a single landmass?
A) Rocks of the ocean ridges are older than those of the adjacent sea floor.
B) Rock and fossil correlation can be made where the continents appear to fit together.
C) Marine fossils can be found at high elevations above sea level on all continents.
D) Great thicknesses of shallow-water sediments are found at interior locations on some continents.

Base your answer to the next 2 questions on the diagram, "Distance from Mid-Atlantic Ridge (km)" to the right.

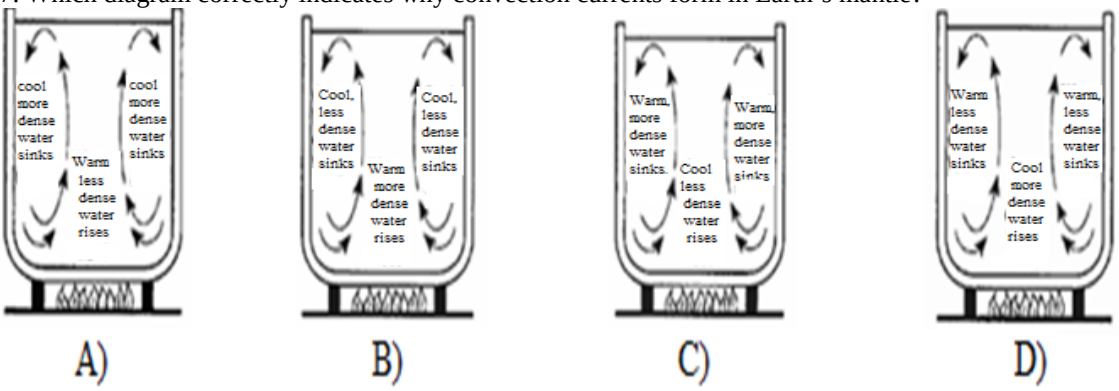


14. Crust that originally formed at the Mid-Atlantic Ridge is now 37 kilometers from the ridge. Approximately how long ago did this crust form?
A) 1.8 million years ago
B) 2.0 million years ago
C) 3.0 million years ago
D) 45 million years ago

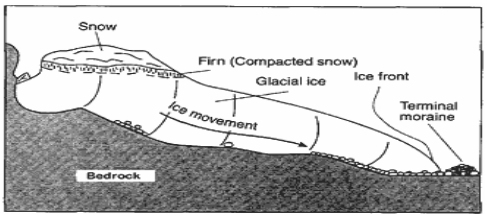
15. Which shows the relative plate motion that the continents on opposite sides of the Mid-Atlantic Ridge are moving in?
A) ➔➔ B) ➔➔ C) ↑↓ D) ↙↘

16. Which provides the best explanation for the mechanism that causes plates to move across the Earth's surface?
A) convection currents in the mantle
B) faulting of the lithosphere
C) the spin of the Earth on its axis
D) unconformities in Earth's crust

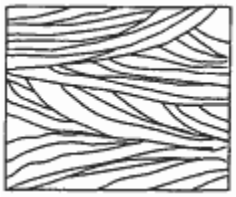
17. Which diagram correctly indicates why convection currents form in Earth's mantle?

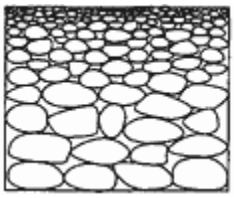


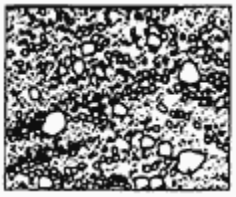
Base your answer to the next 4 questions on the diagram below which represents the profile of a mountain glacier in the northern United States.

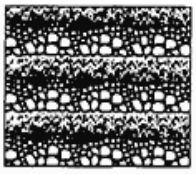


18. Which cross section best represents sediment that was transported and deposited by this glacier?

A) 

B) 

C) 

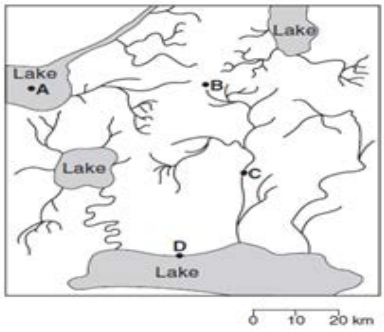
D) 

19. The velocity of the ice movement is primarily controlled by the
A) slope of bedrock surface
B) amount of sediment at the terminal moraine
C) length of the glacier
D) size of the sediment transported by the glacier

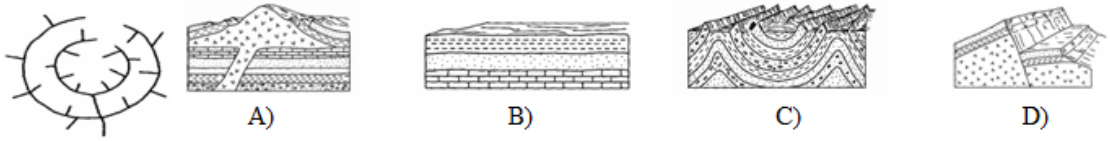
20. Over the period of years, the glacier gains more snow mass than it loses. What will be the most likely result of this gain?
A) The glacier will decrease in size, and the ice front will retreat
B) The glacier will decrease in size, and the ice front will advance
C) The glacier will increase in size, and the ice front will retreat
D) The glacier will increase in size, and the ice front will advance

21. If the climate warms, causing the glacier to melt away, the region that the glacier formerly occupied will be a
A) V-shaped valley with jagged bedrock
B) U-shaped valley with polished bedrock
C) flat plain with bedrock that has been metamorphosed
D) deep ocean trench with bedrock that has been melted and cooled

22. The map to the right shows the stream drainage patterns for a region of Earth's surface. Points A,B,C, and D are locations within the region. The highest elevation most likely exists at point:
A) A
B) B
C) C
D) D



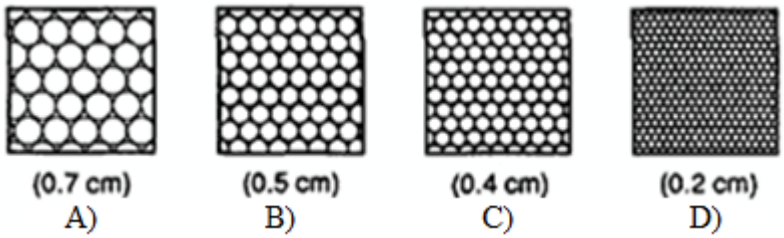
23. Which geologic cross section (A, B, C, or D) represents a landscape region most likely to produce this drainage pattern?



24. Characteristics such as composition, porosity, permeability, and particle size are used to describe different types of:
A) hillslopes
B) stream drainage patterns
C) soils
D) landscapes

25. The groundwater storage for a location is at the maximum. If the precipitation is greater than the potential evapotranspiration in this area, which will occur?
A) There will be a water surplus
B) The soil permeability will increase
C) Water usage will occur
D) The ground storage will be increased

26. Which sample will have the **lowest** infiltration time?



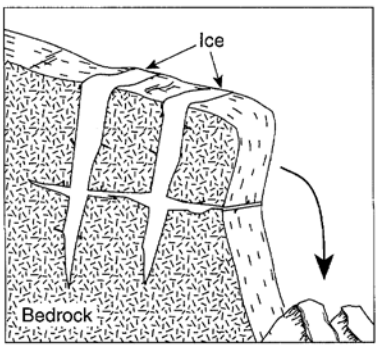
27. The area of land drained by a river and its tributaries is best described as the river's
A) topography B) watershed C) water table D) floodplain

28. Which characteristics identify mountain landscape regions?
A) steep slopes with deformed bedrock
B) steep slopes with horizontal bedrock
C) gentle slopes with deformed bedrock
D) gentle slopes with horizontal bedrock

29. Which climate conditions most likely produce a landscape with rounded hills, large river valleys with many tributaries, and tropical vegetation?
A) cool and arid
B) cool and humid
C) warm and arid
D) warm and humid

30. Which types of weathering and erosion are primarily responsible for the formation of caves?
A) physical weathering and runoff
B) physical weathering and groundwater flow
C) chemical weathering and runoff
D) chemical weathering and groundwater flow

31. The diagram to the right shows a process called frost wedging. Frost wedging occurs because



A) water contracts when it freezes
B) water expands when it freezes
C) water gives off carbon dioxide
D) acid rain is present

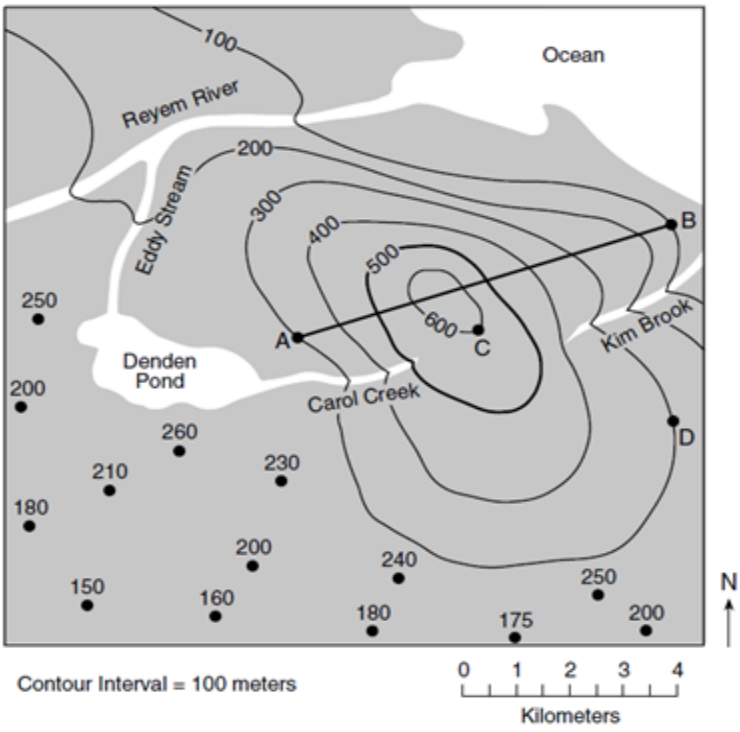
32. Why will a rock weather more rapidly if it is broken into smaller particles?
A) The mineral structure of the rock has been changed
B) The smaller particles are less dense
C) The total mass of the rock and the particles is reduced
D) There is more surface area exposed

Base your answer to questions 33-36 on the topographic map to the right and on your knowledge of Earth Science. Points A, B, C, and D represent locations on the surface of Earth. Elevations are measured in meters

33. What is the highest possible elevation on line A-B?
A) 599 meters
B) 600 meters
C) 699 meters
D) 700 meters

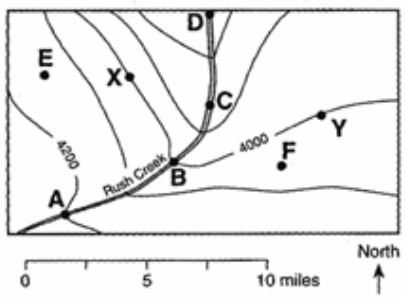
34. What direction is Kim Brook flowing?
A) northwest
B) northeast
C) southwest
D) southeast

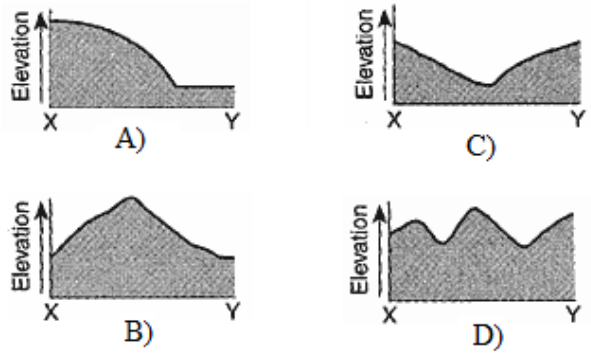
35. What is the approximate gradient between points C & D?
A) 25 m/km
B) 50 m/km
C) 75 m/km
D) 300 m/km



36. Which side of this mountain would have the most gentle slope to climb?
A) north B) south C) east D) west

37. Which diagram best represents the profile along a straight line between points *X* and *Y*?





38. The angle of the star Polaris above the northern horizon can help an observer determine their
A) solar time B) local time C) longitude D) latitude

39. At which latitude will Polaris be overhead?
A) 0º B) 23.5ºN C) 90ºN D) 90ºS

40. The table to the right shows the distance that an observer must travel on a north-south line along the surface of the Earth in order to change the observed altitude of Polaris is 5°. The best inference about the Earth's shape that can be made from these observations is that the Earth
A) a perfect sphere
B) flattened at the Equator
C) has a curved surface
D) has a very smooth surface

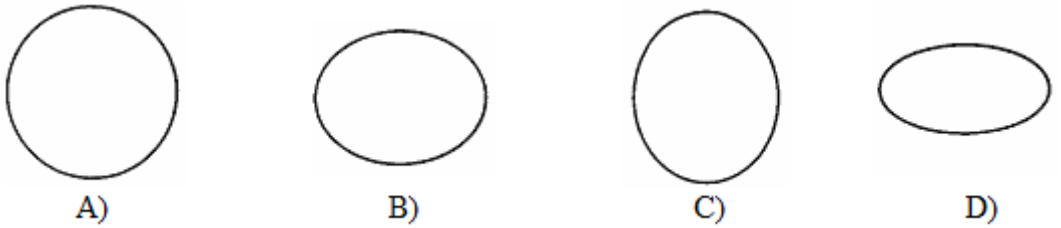
LATITUDE	DISTANCE TRAVELED TO CHANGE THE OBSERVED ALTITUDE OF POLARIS BY 5°
Between 0° and 5° N	552.75 kilometers
Between 45° N and 50° N	555.78 kilometers
Between 85° N and 90° N	558.36 kilometers

41. A scaled model of Earth was drawn. The polar diameter of the Earth was drawn at a length of 4 feet. What would an accurate scaled model of the equatorial diameter be?
A) 2 feet B) 3 feet C) 4 feet D) 5 feet

42. Which location is south in relation to the Tropic of Capricorn?
A) Arctic Circle C) Tropic of Cancer
B) Antarctic Circle D) Equator

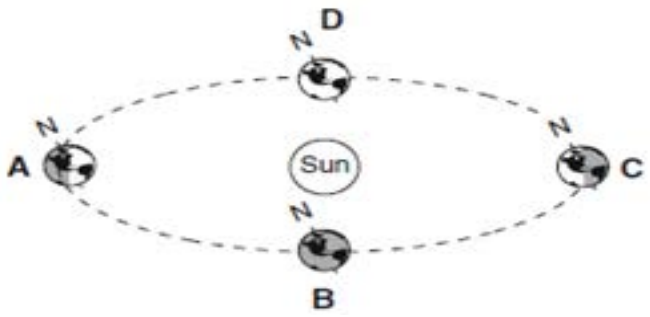
43. The basis for the time difference between adjoining time zones is Earth's
A) 1°/hr rate of revolution
B) 1°/hr rate of rotation
C) 15°/hr rate of revolution
D) 15°/hr rate of rotation

44. Which diagram most accurately shows the oblate shape of earth?



45. How many days a year does New Jersey receive direct sunlight?
A) 0 B) 15 C) 180 D) 365

Use the diagram to the right to answer questions 46-48.



46. Which position of Earth represents the first day of spring in New Jersey?
A) A B) B
C) C D) D

47. When does Earth orbit fastest in space?
A) A B) B
C) C D) D

48. At which location are the Sun's noontime rays perpendicular to the Earth's surface at the Tropic of Cancer (23.5° N)
A) A B) B C) C D) D

49. During which month does the sun rise north of due east in New Jersey?
A) July B) December C) October D) February

50. Moon phases over the course of 1 year are considered to be motions that are
A) noncyclic and unpredictable
B) noncyclic and predictable
C) cycle and unpredictable
D) cyclic and predictable

Base your answer to questions 51-52 on the moon phase diagram below.

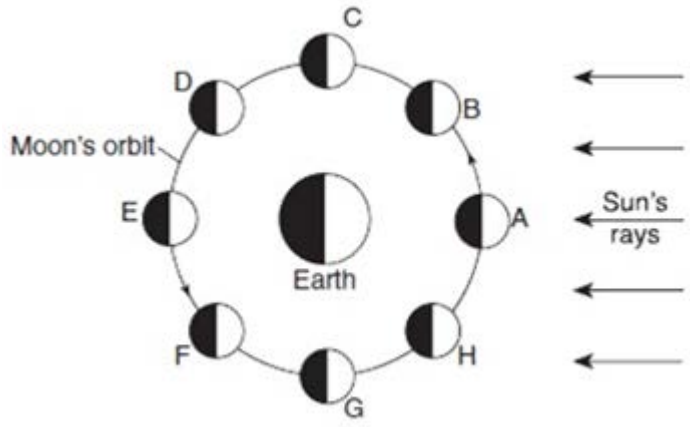
51. Which moon phase is observed in New Jersey when the moon is located at position G on the diagram below?

A) 

B) 

C) 

D) 

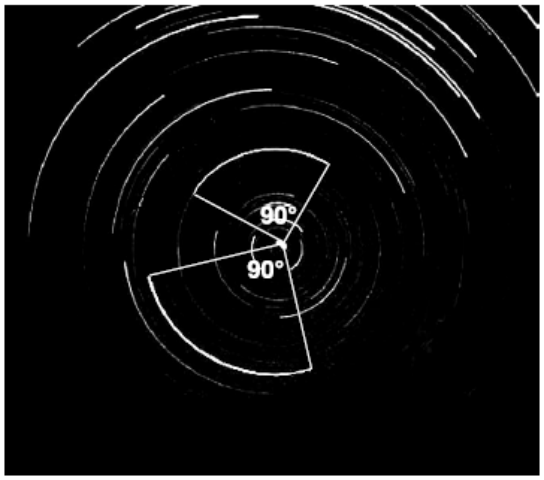


52. At which moon position could a lunar eclipse occur?
A) A B) C C) E D) F

53. As a planet's distance from the Sun increases, what happens to the orbital velocity of that planet?
A) increases B) decrease C) stays the same

54. The rising and setting of the Sun as seen from the Earth are caused by the
A) rotation of the Sun
B) rotation of the Earth
C) revolution of the Earth
D) revolution of the Sun

55. A camera was placed in an open field and pointed toward the northern sky. The lens of the camera was left open for a certain amount of time. The result is shown in the photograph below. The angle of the arc through which two of the stars appeared to move during this time exposure is shown. No question asked. Key has C Should have said how many hours did the stars rotate?

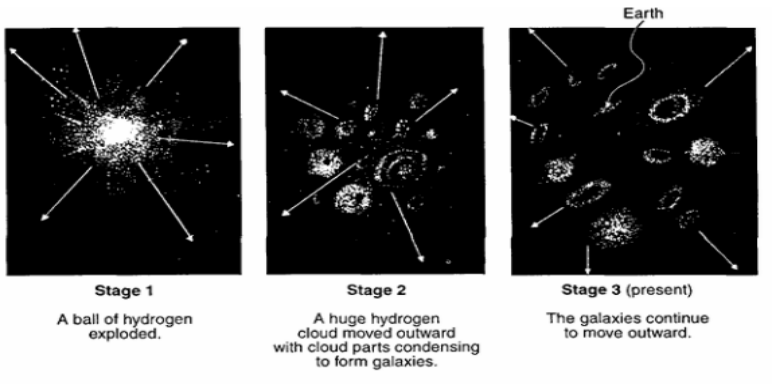


A) 12 B) 2 C) 6 D) 4

56. If we observe a Doppler blue shift from a star, the star must be
A) cool in temperature
B) blue in color
C) moving towards us
D) moving away

57. The diagrams below represents three stages of a current theory of the formation of the universe. A major piece of scientific evidence supporting this theory is the fact that wavelengths of light from galaxies moving away from Earth in stage 3 are observed to be

A) shorter than normal and red shift
B) shorter than normal and blue shift
C) longer than normal and red shift
D) longer than normal and blue shift



58. Most of the radiant energy released by the sun results from the process of
A) nuclear fusion
B) nuclear fission
C) combustion
D) electrical generation

59. Use the diagram below to determine the dewpoint temperature, if the air temperature is 0°C and the wet-bulb is -2°C.

A) 1°C
B) 2°C
C) -3°C
D) – 6°C

Dewpoint (°C)

Dry-Bulb Temperature (°C)	Difference Between Wet-Bulb and Dry-Bulb Temperatures (C°)															
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
−20	−20	−33														
−18	−18	−28														
−16	−16	−24														
−14	−14	−21	−36													
−12	−12	−18	−28													
−10	−10	−14	−22													
−8	−8	−12	−18	−29												
−6	−6	−10	−14	−22												
−4	−4	−7	−12	−17	−29											
−2	−2	−5	−8	−13	−20											
0	0	−3	−6	−9	−15	−24										
2	2	−1	−3	−6	−11	−17										
4	4	1	−1	−4	−7	−11	−19									
6	6	4	1	−1	−4	−7	−13	−21								
8	8	6	3	1	−2	−5	−9	−14								
10	10	8	6	4	1	−2	−5	−9	−14	−28						
12	12	10	8	6	4	1	−2	−5	−9	−16						
14	14	12	11	9	6	4	1	−2	−5	−10	−17					
16	16	14	13	11	9	7	4	1	−1	−6	−10	−17				
18	18	16	15	13	11	9	7	4	2	−2	−5	−10	−19			
20	20	19	17	15	14	12	10	7	4	2	−2	−5	−10	−19		
22	22	21	19	17	16	14	12	10	8	5	3	−1	−5	−10	−19	
24	24	23	21	20	18	16	14	12	10	8	6	2	−1	−5	−10	−18

60. Which list correctly matches each instrument with the weather variable it measures?

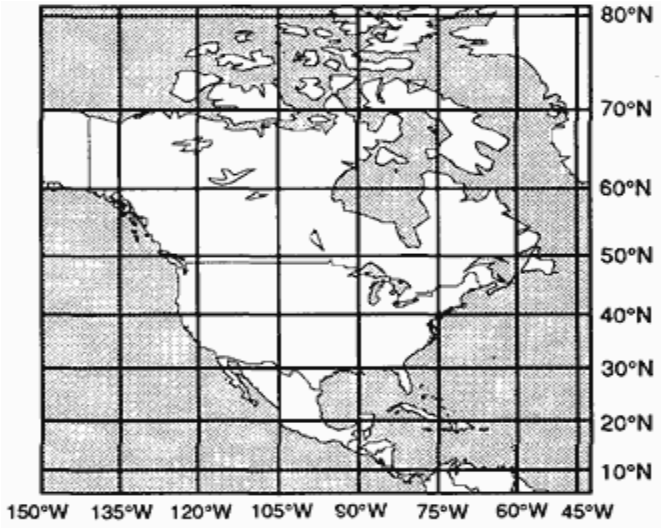
A) wind vane- wind speed
thermometer- temperature
precipitation gauge- humidity

B) wind vane- wind direction
thermometer- dewpoint
psychrometer- air pressure

C) barometer- relative humidity
anemometer- cloud cover
precipitation gauge- acid rain

D) barometer- air pressure
anemometer- wind speed
psychrometer- relative humidity

Base your answer to questions 61-62 on the map of North America to the right.

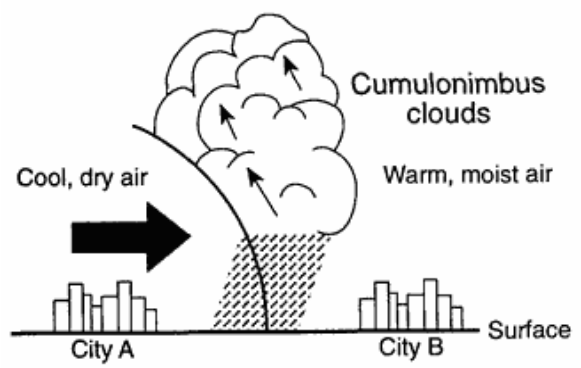


61) Based on this map, an air mass that originates with its center located at 25°N and 90°W would be classified as
A) cP C) mP
B) mT D) cT

62. In the next few days, because of prevailing winds, the air mass will probably move toward the
A) southeast C) northeast
B) southwest D) northwest

63. The cross section below shows a weather front. The large arrow shows the direction of the movement of the cool air mass. Which type of weather front is shown below?

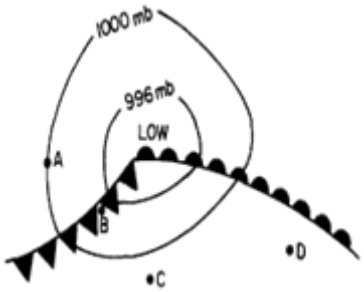
A) cold B) stationary C) warm D) occluded



64. How does the air circulate within a cyclone (low-pressure system) in the Northern Hemisphere?
A) counterclockwise and inward C) clockwise and inward
B) counterclockwise and outward D) clockwise and outward

65. Cities A, B, C, and D on the weather map below are being affected by a low-pressure system. Which city would have the most unstable atmospheric conditions and the greatest precipitation?

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

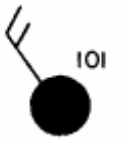


66. The rate of evaporation from the surface of a lake would be increased by

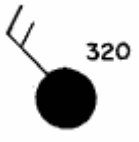
A) a decrease in wind velocity
B) a decrease in insolation
C) an increase in surface area of the lake
D) an increase in the moisture content of the air

67. A weather station records a barometric pressure of 1013.2 milibars. Which diagram best represents this weather station on a weather map?

A)



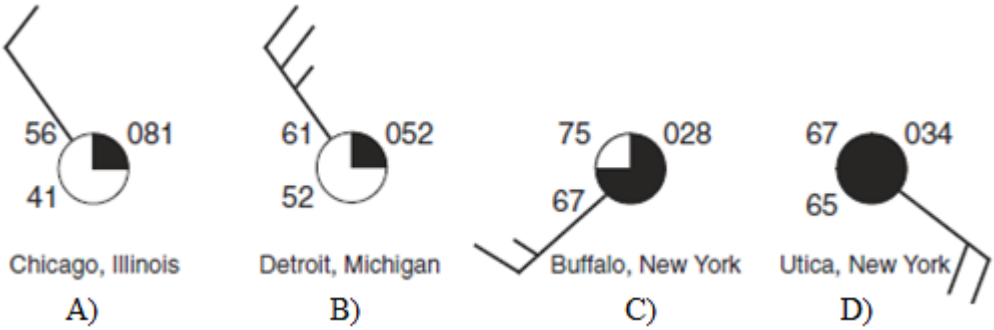
C)



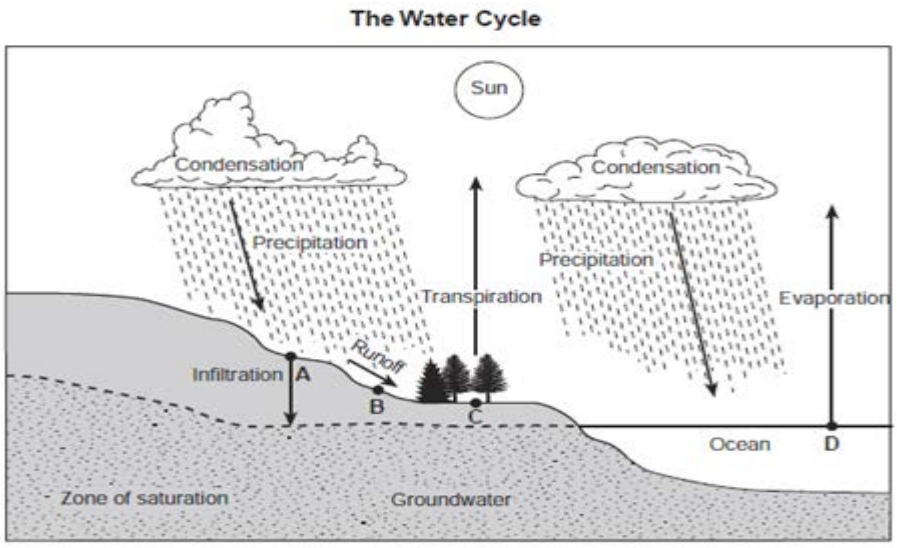
B)

D)

68. Which city below has the lowest relative humidity?



Base your answer to questions 69-71 on the cross section below and your knowledge of Earth Science. The cross section represents the water cycle. Arrows represent the movement of water. Letters A,B,C, and D represent locations on Earth's surface.



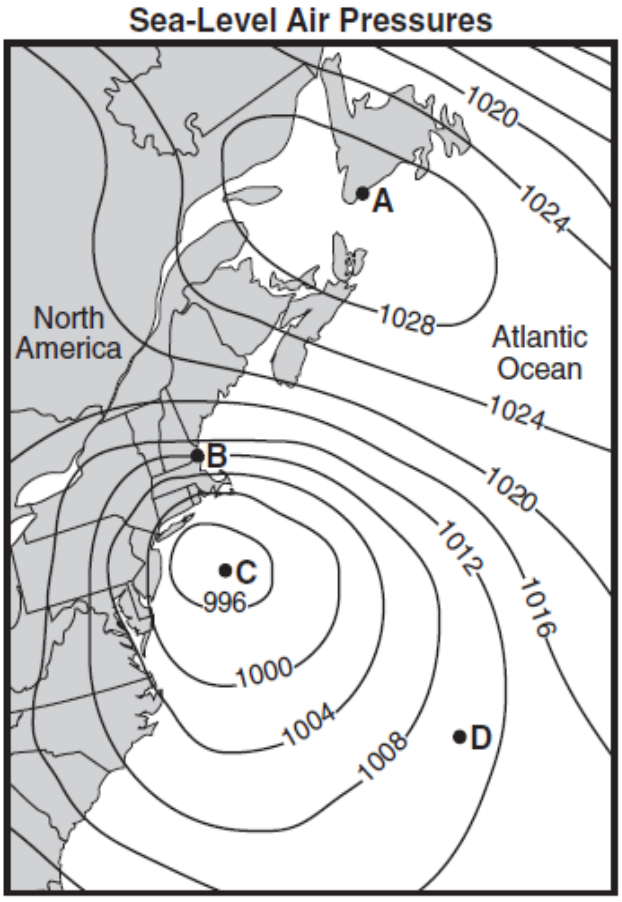
69. The downward movement of water from location A will usually be greatest when the soil is
A) nonporous and the particles are uniformly small in size
B) nonporous and the particles are uniformly large in size
C) porous and the particles are uniformly small in size
D) porous and the particles are uniformly large in size

70. What would most likely reduce the amount of runoff at location B?
A) infiltration occurring faster than precipitation
B) greater condensation than evaporation
C) saturated soil below the land surface
D) a frozen land surface

71. The greatest amount of transpiration and evaporation will occur most likely when the air temperature is
A) low and the humidity is low
B) low and the humidity is high
C) high and the humidity is low
D) high and the humidity is high

72. Use the "Sea-Level Air Pressure" map to the right to answer the following question. Which location most likely recorded the highest wind speed?

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



NEW JERSEY SCIENCE LEAGUE Corrections

EARTH SCIENCE EXAM ANSWER KEY TAN TEST

DATE: Feb 8, 2018

1	C	19	A	37	C	55	C no question asked
2	D	20	D	38	D	56	C
3	A	21	B	39	C	57	C
4	D	22	B	40	C	58	A
5	B	23	A	41	D	59	D
6	C	24	C	42	B	60	D
7	D	25	A	43	D	61	B
8	B	26	A	44	B	62	C
9	C	27	B	45	A	63	A
10	B	28	A	46	B	64	A
11	D	29	D	47	A	65	B
12	A	30	D	48	C	66	C
13	B	31	B	49	A	67	D
14	C	32	D	50	D	68	A
15	B	33	C	51	A	69	D
16	A	34	B	52	C	70	A
17	A	35	C	53	B	71	C
18	C	36	B	54	B	72	B

Since some earth science courses in New Jersey start with geology, others with astronomy, and still others with meteorology, each of the four tests will include the following topics. Over time, this provides an equal opportunity to everyone. The number in parentheses indicates the approximate number of questions for that topic. The number per topic occasionally varies by one or two, but usually does not.

Geology (Approximately 44 question)

Minerals (4)
Rocks (2)
Earth Structure (2)
Plate Tectonics (4)
Faults/Folds/Seismology (3)
Vulcanism (2)
Glaciation/Deserts (2)
Rivers: Erosion & Deposition (3)
Ground Water/Caves (2)
Ocean Shore Line/Currents/Salinity(3)
Weathering/Mass Wasting (2)
Historical Geology (4)
Map Reading: Road/Topo/Geologic (4)
Geodesics/Time/Map Projections (3)

Astronomy (approximately 14 Questions)

Sun (2)
Moon (2)
Sun-Moon-Earth System (3)
Solar System (3)
Stars (2)
Galactic Systems (2)
Cosmology (2)

Meteorology (Approximately 14 Questions)

Insolation/Temperature/Air Masses (3)
Atmospheric Pressure/Highs/Lows (4)
Moisture in the Atmosphere (3)
Frontal Systems (3)
Interpreting Weather Maps (3)

Dates for 2018 Season

Thursday February 8, 2018
Thursday March 8, 2018 Thursday April 12, 2018
All areas and schools must complete the April exam and mail in the results
by April 28th, 2018

New Jersey Science League
PO Box 65 Stewartsville, NJ 08886-0065
phone # 908-213-8923 fax # 908-213-9391 email: newjsl@ptd.net
Web address: http://entnet.com/~personal/njscil/html/

What is to be mailed back to our office?

PLEASE RETURN THE AREA RECORD AND ALL TEAM MEMBER SCANTRONS
(ALL STUDENTS PLACING 1ST, 2ND, 3RD, AND 4TH).
If you return Scantrons of alternates, then label them as ALTERNATES.

Dates for 2019 Season

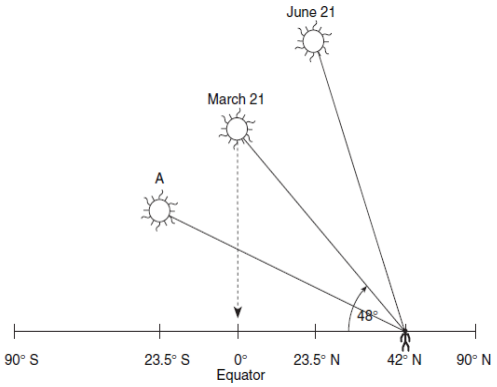
Thursday January 10, 2019 Thursday February 7, 2019
Thursday March 7, 2019 Thursday April 11, 2019

Earth Science Exam April 14, 2018 -TAN EXAM Corrections

Please PRINT your name, school, area, and which test you are taking onto the scantron. Choose the answer that best completes the statements or questions below and fill in the appropriate response on the scantron. If you change your answer, be sure to completely erase your first choice.

1. When the Sun is at position A, which latitude receives the most direct rays of the Sun?

A) Tropic of Cancer (23.5 °N)
B) Tropic of Capricorn (23.5°S)
C) Equator (0°)
D) Antarctic Circle (66.5°S)

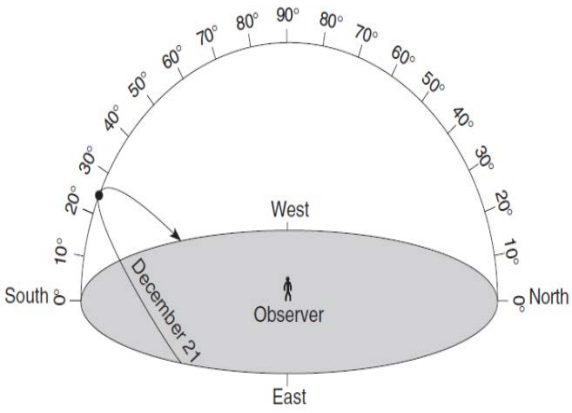


2. The passage of the Moon into Earth's shadow causes a

A) lunar eclipse B) solar eclipse C) new Moon D) full Moon

3. The Sun's apparent path for December 21st is shown in the diagram below. What direction will the sun set in on December 21st?

A) Northeast
B) Northwest
C) Southeast
D) Southwest



4. Seismic studies of the Moon have helped scientists to make inferences about

A) water erosion on the Moon
B) weathering on the Moon's surface
C) radioactivity of the Moon's surface rocks
D) the Moon's interior

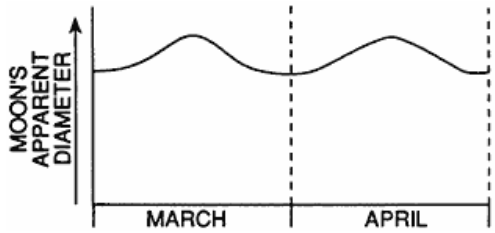
5.Ocean tides observed at coastal locations each day are primarily caused by

A) Earth's revolution around the sun
B) the changing phases of the Moon
C) the gravitational attraction between the Moon & Earth
D) seasonal changes in the compass location of sunrise

6. Which observation can NOT be explained by a geocentric model?

A) Stars follow circular paths around Polaris
B) The Sun's path through the sky is an arc
C) A planet's apparent diameter varies
D) A freely swinging pendulum appears to change direction

7. An observer on the Earth measured and recorded the slight changes in the apparent diameter of the Moon for 2 months. A graph of the data is shown below. Which statement best explains the observation?



A) The moon actually increases and decreases in size each month.
B) The apparent diameter of the Moon is always greatest at the new-moon phase
C) The distance from the Earth to the Moon varies in a cyclic manner
D) The Earth revolves around the Moon each month

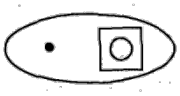
8. What is the true shape of each planet's actual orbit around the Sun?
A) perfectly circular B) nearly spherical C) slightly elliptical D) very eccentric

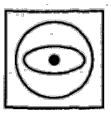
9. When will the gravitational attraction between the Earth and the Sun be the greatest?
A) when the Earth is closes to the Sun
B) when the Earth is farthest from the Sun
C) every day at exactly noon
D) every night at exactly midnight

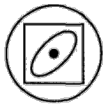
10. The velocity of a galaxy can be measured by measuring
A) how fast its apparent size decreases
B) how many lines occur in its spectrum
C) the shift in the pattern of lines in its spectrum
D) how fast it changes position in the sky

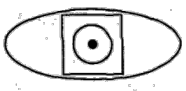
11. A blue shift of the light form a star indicates that the star
A) is moving closer to Earth
B) is moving away from Earth
C) will soon become a giant star
D) will soon become a main sequence star

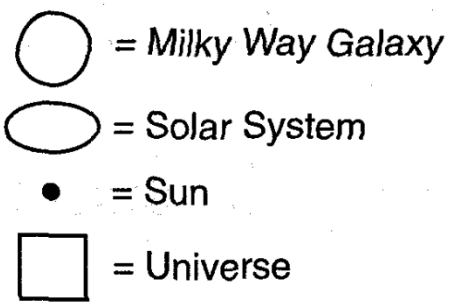
12. The symbols to the right represent the Milky Way galaxy, the solar system, Sun, and the universe. Which arrangement of symbols is most accurate?

A) 

C) 

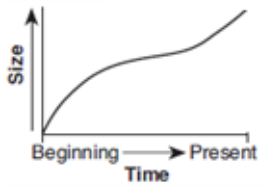
B) 

D) 

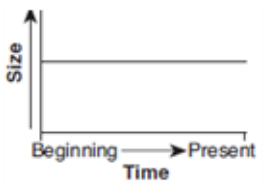


13. Accoring to the Big Bang theory, which graph best represents the relationship between time and the size of the universe from the beginning of the universe to the present based upon our current understanding? The choices are in the diagram.

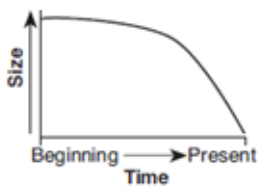
A)



B)



C)



D)

14. Based on the data table below, which statement is true?

A) The closer to the sun, the hotter the planet is
B) The farther from the Sun, the slower the orbital speed
C) Average surface temperature depends on the average orbital velocity
D) The average distance from the Sun has no effect upon orbital speed or temperature.

Data Table

Planet	Average Distance from Sun (millions of km)	Average Surface Temperature (°C)	Average Orbital Velocity (km/sec)
Mercury	58	167	47.9
Venus	108	457	35.0
Earth	150	14	29.8
Mars	228	–55	24.1
Jupiter	778	–153	13.1
Saturn	1427	–185	9.7
Uranus	2869	–214	6.8
Neptune	4496	–225	5.4

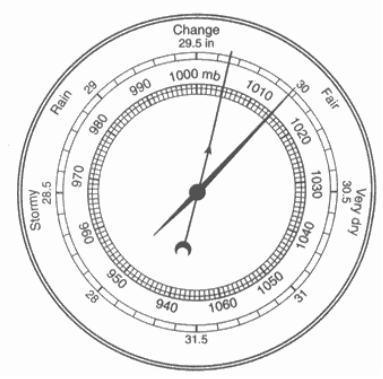
15. Wind moves from regions of
A) high temperatures to low temperatures
B) high pressures to low pressures
C) high areas of precipitation to low areas
D) high humidity regions to low humidity regions

16. Which event will most likely occur in rising air?
A) clearing skies B) decreasing humidity C) cloud formation D) increase in temperature

17. Which factor most directly affects the wind speed between two locations?
A) air pressure B) Coriolois force C) dewpoint temperature D) cloud cover

18. Which weather variable is measured by the instrument below?

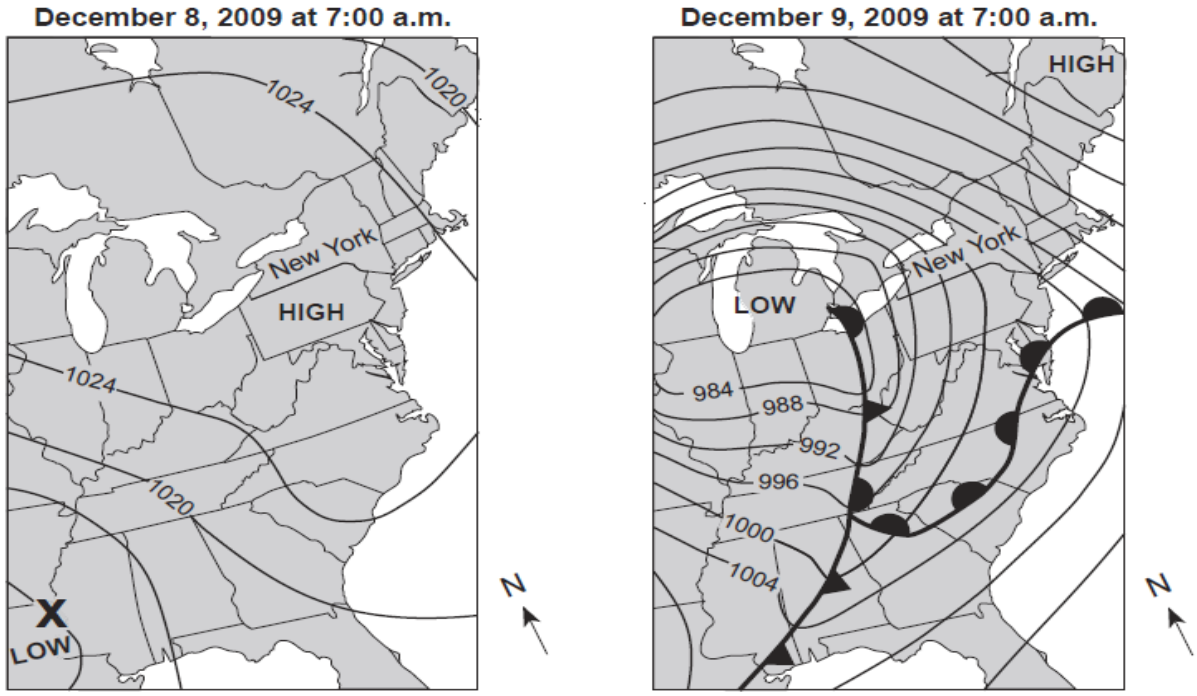
A) wind speed
B) relative humidity
C) wind direction
D) air pressure



19. A city located on the coast of North America has warmer winters and cooler summers than a city at the same elevation and latitdue lcoated near the center of North America. Which statement best explains the difference between the cities' climates?

A) Ocean surfaces change temperature more slowly than land surfaces
B) Warm, moist air rises when it meets cool,dry air.
C) Wind speeds are usually greater over land surfaces than over ocean surfaces
D) Ocean surfaces have a lower specific heat than land surfaces

Base your answers to questions 20-22 on the diagrams below. The weather maps show the eastern US on two consecutive days. Some isobars are labeled in millibars (mb). Letter X represents a location on Earth's surface on December 8, 2009.



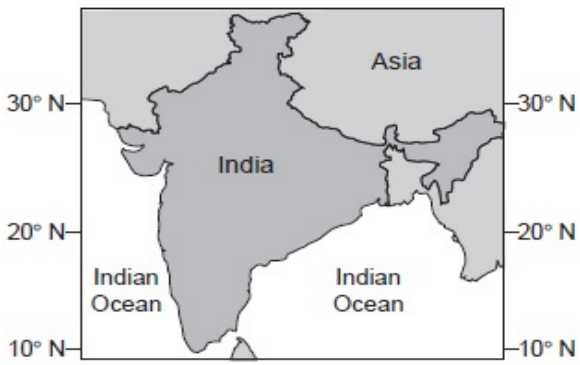
20. Which type of front was located just south of NYC/NJ on December 9th?
A) Cold front B) warm front C) stationary front D) occluded front

21. What was the barometric pressure for location X on December 8th?
A) 1004 mb B) 1008mb C) 1012 mb D) 1016 mb

22. Which information shown on the weather maps best indicates that wind speeds in the Northeast were greater on December 9th than on December 8th?

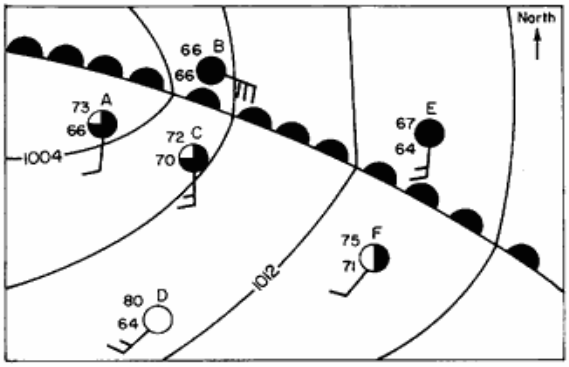
A) The isobars were closer together on Decmeber 9th
B) The fronts were closer together on December 9th
C) The air pressure was lower on December 9th
D) The air pressure was higher on December 9th

23. The map below shows the location of India and the Indian Ocean. Which statement best describes the monsoon winds during rainy season in India?



A) warm, moist air flows from India to the Indian Ocean
B) warm, moist air flows form the Indian Ocean to India
C) cold, dry air flows from India to the Indian Ocean
D) cold, dry air flows from the Indian Ocean to India

24. Which station model below has the greatest chance of precipitation?



A) A
B) B
C) E
D) F

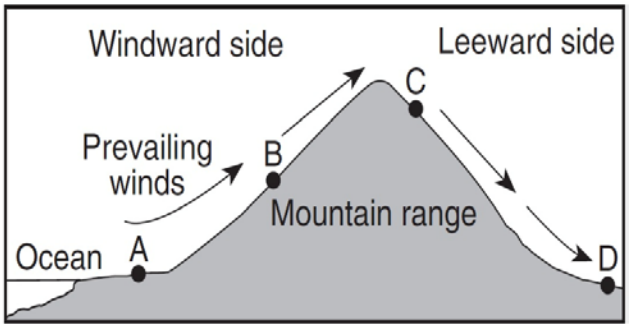
25. Jet stream winds over the United States generally move from

A) east to west
B) west to east
C) north to south
D) south to north

26. Which climate condition generally results from both an increase in distance from the equator and an increase in elevation above sea level?

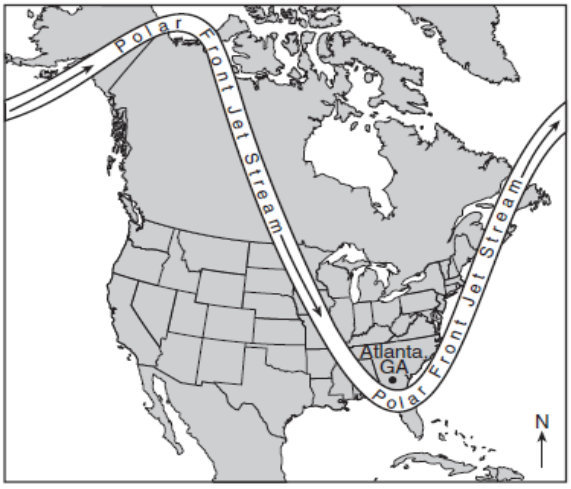
A) cooler temperatures
B) warmer prevailing winds
C) increased precipitation
D) increased air pressure

27. Which location will most likely have the least annual precipitation?



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

28. The map of North America below shows the position of the polar front jet stream on January 7th, 2014, and the location of Atlanta, Georgia. Which type of air mass was most likely located over Atlanta, Geogia?



A) mT
B) mP
C) cT
D) cP

29. The internal atomic structure of a mineral most likely determines the mineral's
A) color, streak, and age
B) origin, exposure, and fracture
C) size, location, and luster
D) hardness, cleavage, and crystal shape

30. Which phrase best describes the sedimentary rock bituminous coal?
A) low density and mafic composition
B) chemical precipitate from saltwater
C) organic plant remains
D) glassy texture and volcanic origin

31. A student obtains a cup of quartz sand from a beach. A saltwater solution is poured into the sand and allowed to evaporate. The mineral residue from the saltwater solution cements the sand grains together, forming a material that is most similar in origin to

A) an extrusive igneous rock
B) an intrusive igneous rock
C) a clastic sedimentary rock
D) a foliated metamorphic rock

32. Halite has three cleavage directions at 90º to each other. Which model best represents the shape of a broken sample of halite?

A) B) C) D)

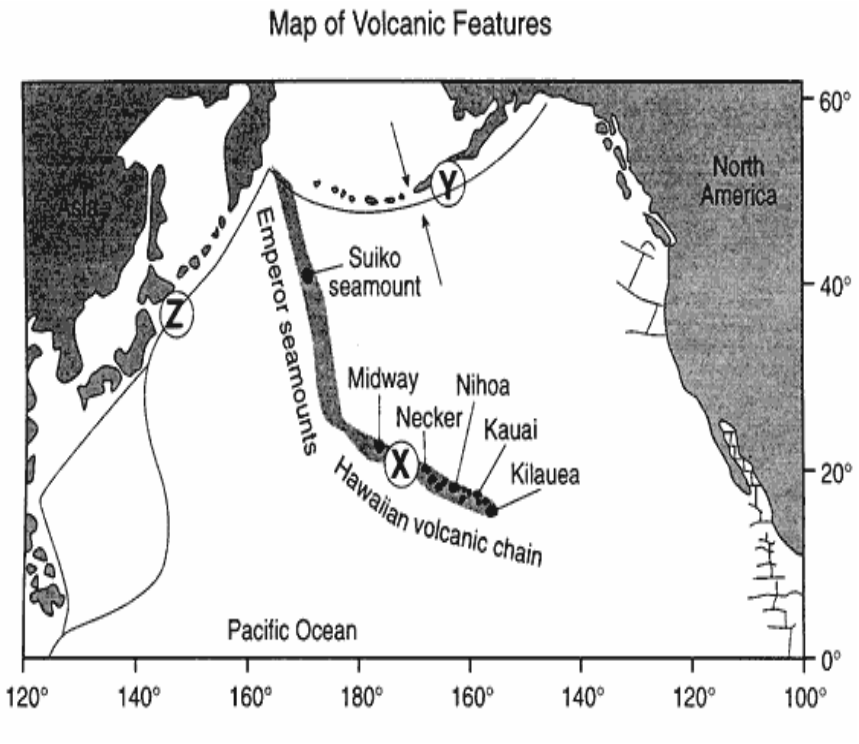
33. Which process is necessary for the formation of <u>all</u> igneous rocks?
A) solidification B) deposition C) metamorphism D) erosion

34.What is the main difference between metamorphic rocks and most other rocks?
A) Many metamorphic rocks contain only one mineral
B) Many metamorphic rocks have an organic composition
C) Many metamorphic rocks exhibit banding and distortion of structure
D) Many metamorphic rocks contain a high amount of oxygen-silicon tetrahedra

35. Earth's outer and inner core are both inferred to be
A) solid B) liquid C) equal pressures D) composed of high % of iron

36. Andrija Mohorovicic discovered the interface between the crust and the mantle that is now named for him. The "MOHO" was based on analysis of
A) landscape boundaries C) erosional surfaces
B) continental coastlines D) seismic waves

Use the two diagrams below to answer questions 37-39.



Data Table
Age of Volcanic Features

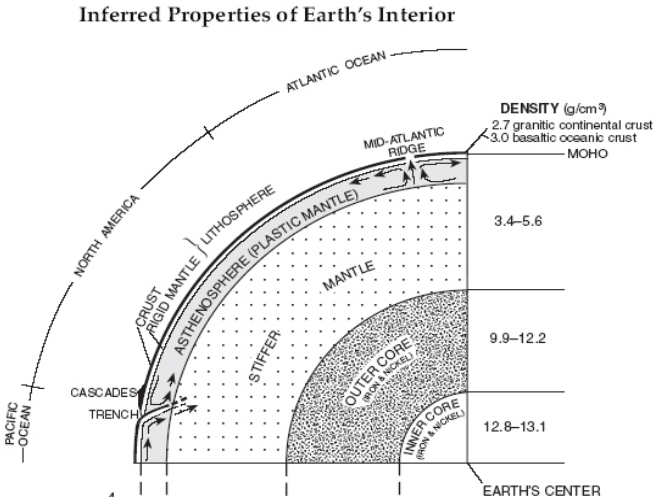
Volcanic Feature	Distance from Kilauea (km)	Age (millions of years)
Kauai	545	5.6
Nihoa	800	6.9
Necker	1,070	10.4
Midway	2,450	16.2
Suiko seamount	4,950	41.0

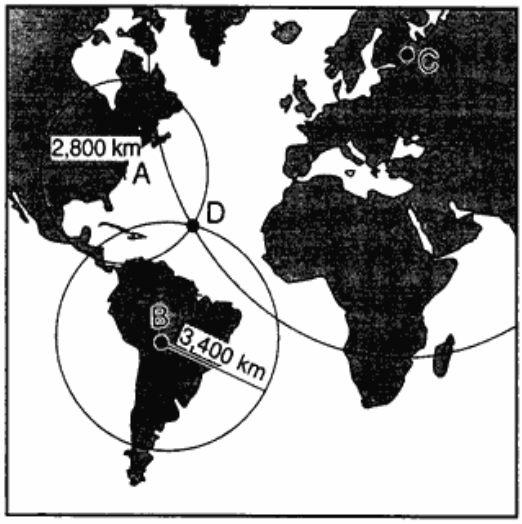
37. Approximately how far has location X moved from its original location over the hotspot?
A) 3,600 km B) 2,500 km C) 1,800 km D) 20 km

38. According to the data table, what is the approximate speed at which the island of Kauai has been moving away from the mantle hotspot, in kilometers per million years?
A) 1 B) 10 C) 100 D) 1,000

39. Which lithospheric plate boundary features are located at Y and Z?
A) trenches created by the subduction of the Pacific Plate
B) rift valleys created by seafloor spreading of the Pacific Plate
C) secondary plates created by volcanic activity within the Pacific Plate
D) mid-ocean ridges created by faulting below the Pacific Plate

Use the two diagrams below to answer questions 40-41.





40. Which statement best describes the igneous crustal bedrock below locations A,B,C, and D?

A) The bedrock below D is mostly basalt; below A,B, and C, the bedrock is mostly granite
B) The bedrock below D is mostly granite; below A,B, and C, the bedrock is mostly basalt
C) The bedrock below A,B,C and D is mostly basalt
D) The bedrock below A,B,C and D is mostly granite

41. Compared to the thickness and density of the continental crust of South America (area B), the oceanic crust of the Atlantic floor (area D) is

A) thinner and less dense
B) thinner and more dense
C) thicker and less dense
D) thicker and more dense

Base your answers to questions 42-45 on the diagram below which shows a top view of the bedrock geology of a portion of the Earth's surface. Two faults (F_1 and F_2) and three periods of igneous activity have occurred in this area.

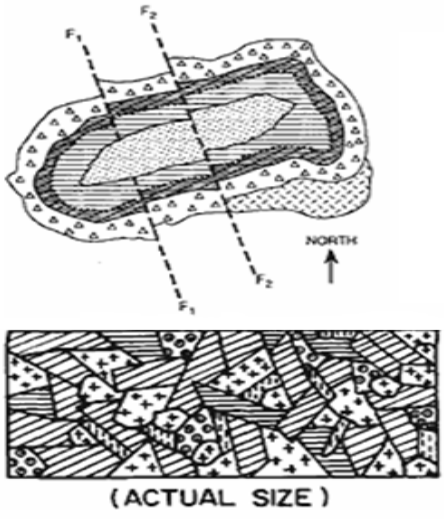
42. Fossil remains would most likely be found in the rock represented by which symbol?

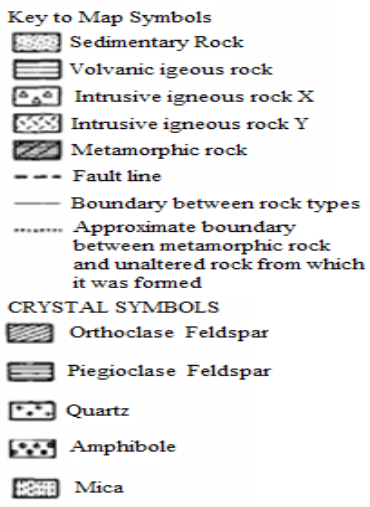
A) 

B) 

C) 

D) 





43. Two rocks X and Y are found in a field. The best evidence that rock *Y* formed after rock *X* would be finding rock *Y*

A) present as broken pieces within rock X
B) intruded into rock X
C) cut by a fault that also cutes rock X
D) weathered more than rock X

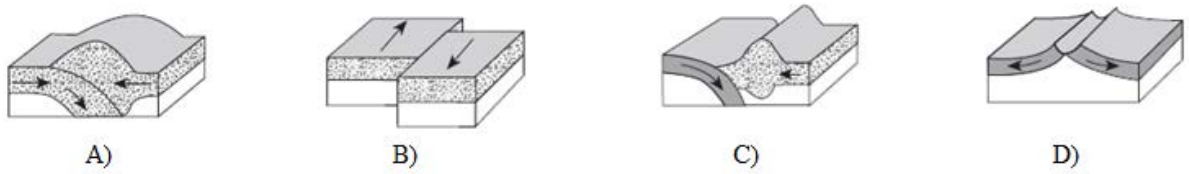
44. When did faults F1 and F2 most likely occur?

A) before the metamorphic rock was formed
B) before the intrusion of igneous rock X
C) at two different times
D) after the sedimentary rock was deposited

45. The metamorphic rock was most likely which rock originally?

A) sedimentary rock
B) volcanic igneous rock
C) intrusive igneous rock X
D) intrusive igneous rock Y

46. Which cross section below best represents the crustal plate motion that is the primary cause of volcanoes and deep rift valleys found at mid-ocean ridges?



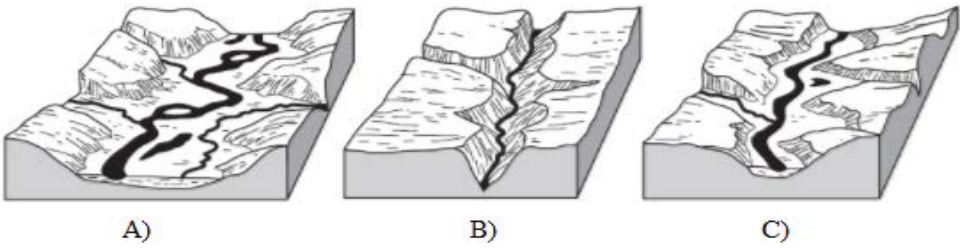
47. The chunks of bedrock removed by glacial quarrying and transported by the glaciers most likely produce

A) terminal outwash plains
B) kettle lake depressions
C) V-shaped valleys
D) parallel scratches in surface bedrock

48. Elongated hills, or drumlins, are most useful in determining the

A) age of a glacier
B) direction the glacier has moved
C) rate at which the glacier is melting
D) thickness of the glacier

Use the diagrams below to answer questions 49-50.



49. Which diagram shows the steepest gradients of the main river?

A) Diagram A
B) Diagram B
C) Diagram C

50. Which diagram shows the oldest stage of the main river?

A) Diagram A B) Diagram B C) Diagram C

51. Compared to an inland location, a location on an ocean shore at the same elevation and latitude is likely to have

A) cooler winters and cooler summers
B) cooler winters and warmer summers
C) warmer winters and cooler summers
D) warmer winters and warmer summers

52. Why are most beaches often considerably cooler than nearby inland locations on hot summer afternoons?
A) A land breeze develops due to the lower specific heat of water and the higher specific heat of the land
B) A sea breeze develops due to the higher specific heat of water and the lower specific heat of land
C) The beaches are closer to the Equator than the inland locations are
D) The beaches are farther from the Equator than the inland locations are

53. The diagrams below represent landscape features found along the seacoast. The arrows show ocean-wave direction. Which shoreline has been shaped more by deposition than by erosion?

A) B) C) D)

54. What is the most common cause of approaching beach waves?
A) underwater earthquakes
B) the gravitational effect of the Moon
C) variations in ocean-water density
D) winds at the ocean surface

55. Older layers of rock may be found on top of younger layers of rock as a result of A and C correct
A) overturning rock layers
B) joints in the rock layers
C) igneous intrusions
D) weathering processes

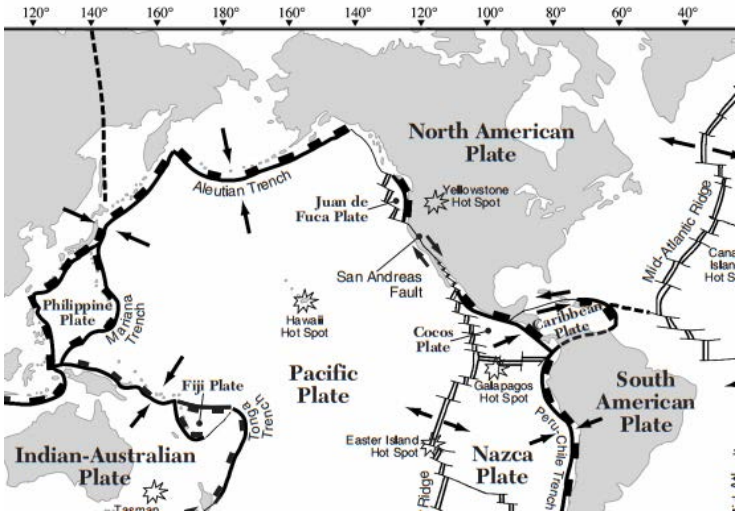
56. Chemical weathering occurs most rapidly in climates that are
A) moist and warm B) moist and cold C) dry and cold D) dry and warm

57. A large rock is broken into several smaller pieces. Compared to the rate of weathering of the large rock, the rate of weathering of the smaller pieces is
A) slower B) faster C) the same

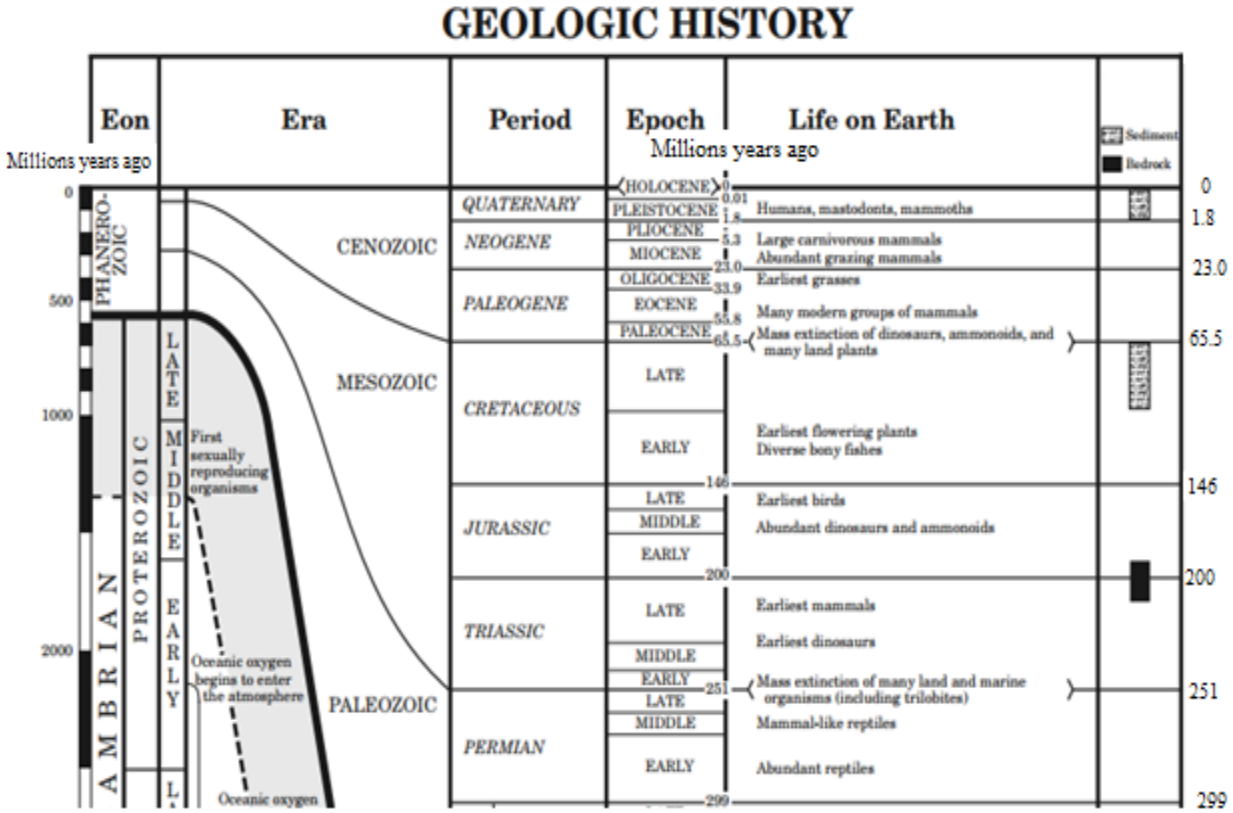
58. An environmental scientist needs to prepare a report on the potential effects that a proposed surface mine in New York State will have on the watershed where the mine will be located. In which reference materials will the scientist find the most useful data with which to determine the watershed's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

59. New Jersey is presently located approximately where on the tectonic plate map to the right?

A) at a convergent plate boundary
B) above a mantle hot spot
C) above a mid-ocean ridge
D) near the center of a large plate



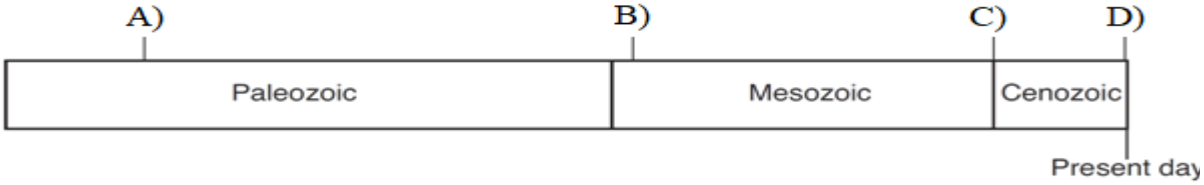
Use the diagram below, Geologic History, to answer questions 60-63.



60. What is the estimated total length of time for the Mesozoic Era?
A) 65 million years C) 225 million years
B) 185 million years D) 345 million years

61. Which form of life below evolved first?
A) birds B) humans C) dinosaurs D) flowers

62. Select the letter below during which the <u>earliest mammals</u> first existed?

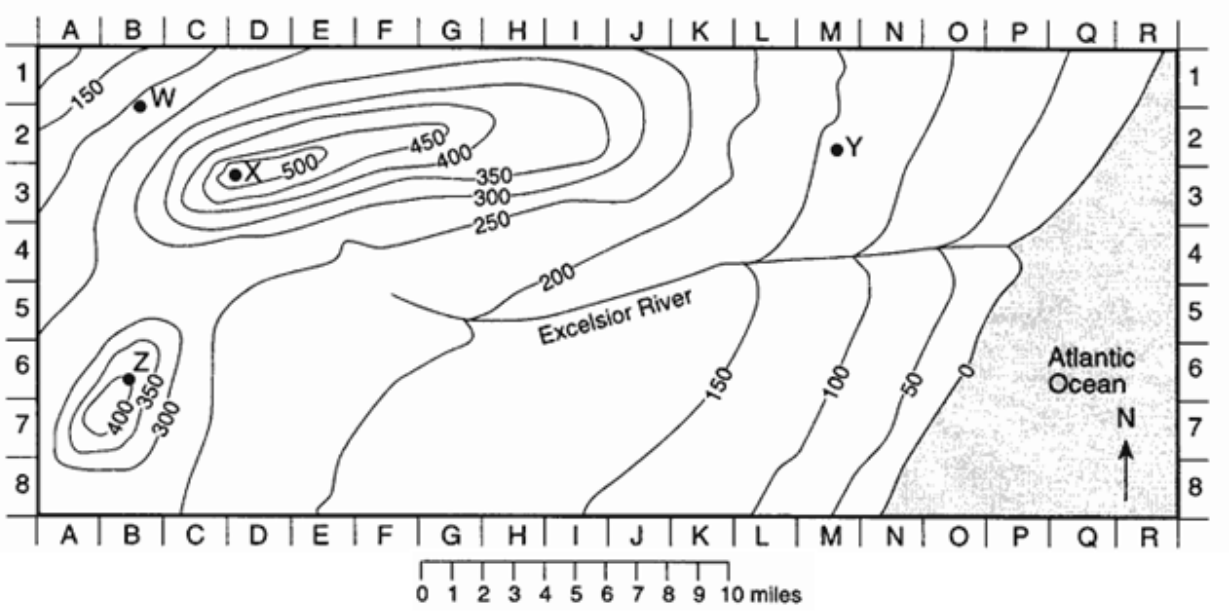


63. Approximately how many million years have humans existed on Earth?
A) 0 million B) .001 million C) 1.8 million D) 5.3 million

64. As a ship crosses the Prime Meridian, the altitude of Polaris measured from the ship is 50°. What is the ship's location?
A) 0° latitude and 50° east longitude C) 50° north latitude and 0° longitude
B) 0° latitude and 50° west longitude C) 50° south latitude and 0° longitude

65. At sea level, which location would be closest to the center of Earth?
A) 45° South B) the Equator C) 23.5°N D) The North Pole

Base your answers to questions 66-70 on the topographic map below that represents a location in North America. A grid system of letters and numbers along the edges of the map is provided to assist in finding locations. All elevations are expressed in feet.



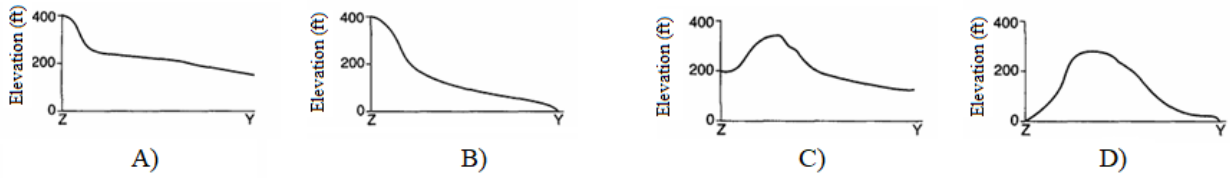
66. What is the approximate elevation at grid location 7-I ?
A) 140 ft B) 170 ft C) 200 ft D) 230 ft

67. What is a possible elevation at point X?
A) 488 ft B) 548 ft C) 558 ft D) 598 ft

68. If a person at point W (2-B) travels uphill, in which direction is the person traveling?
A) NW B) NE C) SW D) SE

69. What is the gradient (slope) of the entire length of the Excelsior River?
A) 0.1 ft/mi B) 11 ft/mi C) 24 ft/mi D) 48 ft/mi

70. Which profile best represents the topography along a line from point Z (6-B) to Y (2-M)?



71. The theory for the formation of the universe which is accepted by most astronomers is the
A) Steady State Theory
B) Big Bang Theory
C) Big Crunch Theory
D) Oscillation Theory

72. There are 24 standard times zones around the world. In degrees of longitude, approximately how wide is one standard time zone?
A) 7.5° of longitude C) 15° of longitude
B) 23.5° of longitude D) 180° of longitude

NEW JERSEY SCIENCE LEAGUE

EARTH SCIENCE EXAM ANSWER KEY TAN TEST Corrections:

DATE: March 8, 2018

Deadline: All March exam results must be post marked by March 16th or scan the record sheet and email to newjsl@ptd.net or the scores will not count.

1	B	19	A	37	C	55	A & C
2	A	20	B	38	C	56	A
3	D	21	C	39	A	57	B
4	D	22	A	40	A	58	A
5	C	23	B	41	B	59	D
6	D	24	B	42	A	60	B
7	C	25	B	43	B	61	C
8	C	26	A	44	C	62	B
9	A	27	D	45	B	63	C
10	C	28	D	46	D	64	C
11	A	29	D	47	D	65	D
12	C	30	C	48	B	66	B
13	A	31	C	49	B	67	B
14	B	32	C	50	A	68	D
15	B	33	A	51	C	69	B
16	C	34	C	52	B	70	A
17	A	35	D	53	B	71	B
18	D	36	D	54	D	72	C

Since some earth science courses in New Jersey start with geology, others with astronomy, and still others with meteorology, each of the four tests will include the following topics. Over time, this provides an equal opportunity to everyone. The number in parentheses indicates the approximate number of questions for that topic. The number per topic occasionally varies by one or two, but usually does not.

Geology (Approximately 44 question)
Minerals (4)
Rocks (2)
Earth Structure (2)
Plate Tectonics (4)
Faults/Folds/Seismology (3)
Vulcanism (2)
Glaciation/Deserts (2)
Rivers: Erosion & Deposition (3)
Ground Water/Caves (2)
Ocean Shore Line/Currents/Salinity(3)
Weathering/Mass Wasting (2)
Historical Geology (4)
Map Reading: Road/Topo/Geologic (4)
Geodesics/Time/Map Projections (3)

Astronomy (approximately 14 Questions)
Sun (2)
Moon (2)
Sun-Moon-Earth System (3)
Solar System (3)
Stars (2)
Galactic Systems (2)
Cosmology (2)

Meteorology (Approximately 14 Questions)
Insolation/Temperature/Air Masses (3)
Atmospheric Pressure/Highs/Lows (4)
Moisture in the Atmosphere (3)
Frontal Systems (3)
Interpreting Weather Maps (3)

Dates for 2018 Season

Thursday March 8, 2018 Thursday April 12, 2018

All areas and schools must complete the April exam and mail in the results by April 28th, 2018

New Jersey Science League
PO Box 65 Stewartsville, NJ 08886-0065
phone # 908-213-8923 fax # 908-213-9391 email: newjsl@ptd.net
Web address: http://entnet.com/~personal/njscil/html/

What is to be mailed back to our office?

PLEASE RETURN THE AREA RECORD AND ALL TEAM MEMBER SCANTRONS
(ALL STUDENTS PLACING 1ST, 2ND, 3RD, AND 4TH).
If you return Scantrons of alternates, then label them as ALTERNATES.

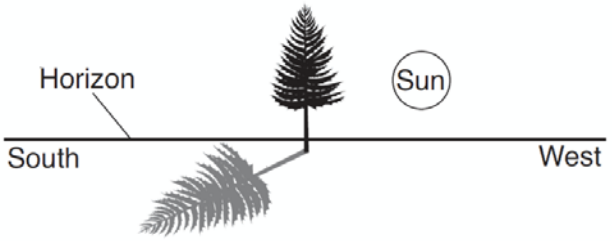
Dates for 2019 Season

Thursday January 10, 2019 Thursday February 7, 2019
Thursday March 7, 2019 Thursday April 11, 2019

Earth Science April Exam 2018 -TAN EXAM Corrected

Please PRINT your name, school, area, and which test you are taking onto the scantron. Choose the answer that best completes the statements or questions below and fill in the appropriate response on the scantron. If you change your answer, be sure to completely erase your first choice.

1. What time of day is represented by the diagram?
A) early morning
B) mid afternoon
C) early evening
D) choices A and B

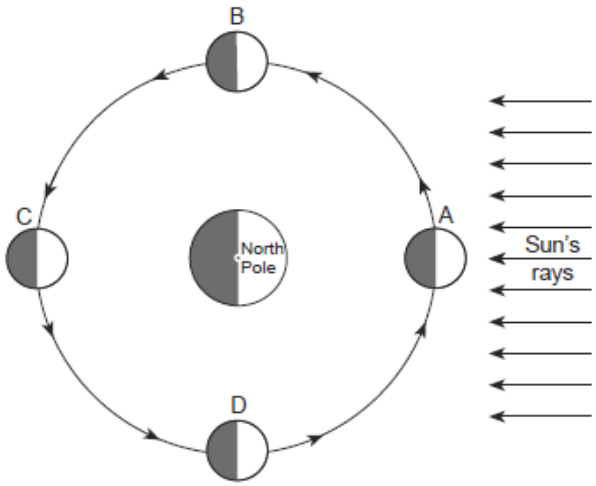


2. When Earth is farthest from the Sun, which season is occurring in the Northern Hemisphere?
A) spring B) summer C) fall D) winter

3. How many hours of daylight are received at the Arctic Circle on the Autumnal Equinox?
A) 0 B) 12 C) 15 D) 24

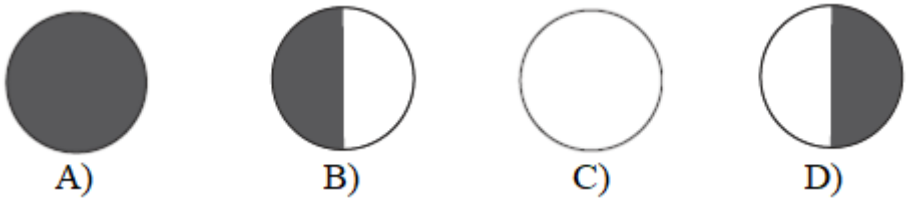
Use the diagram below to answer questions 4 & 5.

4. At which two moon positions would an observer on Earth most likely experience the highest high tides and the lowest low tides?
A) A & B C) C & A
B) B & C D) D & B

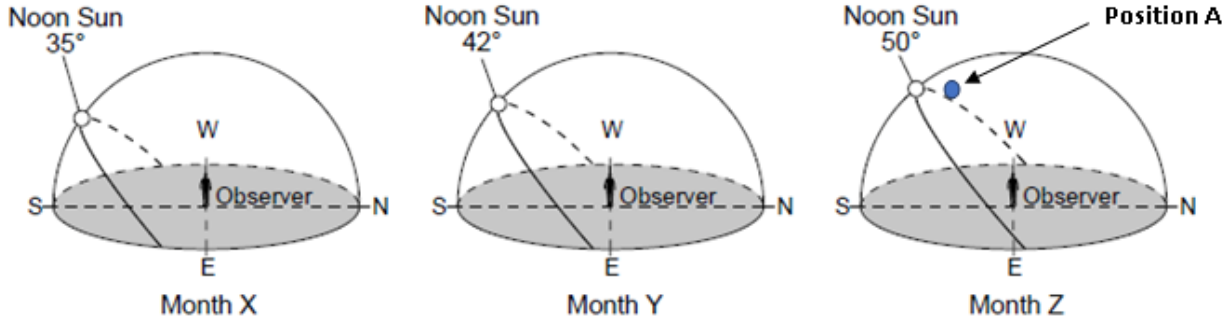


(Not drawn to scale)

5.During which moon phase could an observer on Earth see a lunar eclipse?



Base your answer to questions 6-9 on the three Sun's path diagrams below. The diagram represents the position of the noon Sun along with its apparent daily path as seen by an observer on three consecutive months in New Jersey.



6. Which dates are represented by months X,Y, and Z?
A) X- February 1 , Y- March 1, Z- April 1
B) X- May 1, Y-June 1, Z- July 1
C) X- August 1, Y- September 1, Z- October 1
D) X- November 1, Y- December 1, Z- January 1

7. What characteristic of the Sun's apparent daily path stays constant from month X to month Z?
A) locations of sunrise and sunset
B) altitude of the noon Sun
C) length of the time that the Sun moves along its apparent path
D) rate of the Sun's movement along its apparent path

8. For an observer in the Southern Hemisphere at 43°S, the highest altitude of the noon Sun occurs when the Sun is over the
A) eastern horizon B) western horizon C) northern horizon D) southern horizon

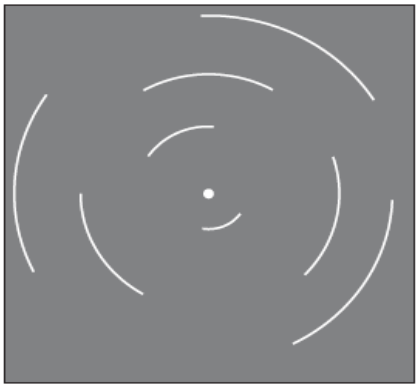
9. Position A along Month Z's sun path is about what time?
A) 7 am B) 1 pm C) 5 pm D) 7 pm

10. The deflection of prevailing winds and ocean currents in the Northern hemisphere is called
A) eccentricity B) refraction C) Coriolis effect D) Doppler effect

11. If Earth's rate of rotation increases, the length of one Earth day will be
A) shorter than 24 hours
B) longer than 24 hours
C) 24 hours, with a shorter nighttime period
D) 24 hours, with a longer nighttime period

12. To an observer in New Jersey, the duration of insolation continually increases from
A) December 1 to February 1
B) June 1 to August 1
C) March 1 to May 1
D) September 1 to November 1

13. At a location in the Northern Hemisphere a camera was placed outside at night with the lens pointing straight up. The shutter was left open for four hours. The star trails below were seen. At which latitude were these star trails observed?



A) 1°N
B) 30 °N
C) 60 °N
D) 90 °N

14. Which apparent motion can be explained by a geocentric model?

A) deflection of wind
B) curved path of projectiles
C) motion of a Foucault pendulum
D) the sun's path through the sky

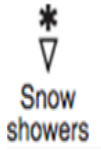
15. Between which two planets are most asteroids located?

A) Earth & Mars
B) Jupiter & Mars
C) Jupiter & Saturn
D) Uranus & Saturn

16. A severe thunderstorm warning was issued on a warm summer afternoon. Which present weather symbol represents the dangerous solid form of precipitation that is commonly associated with some of these severe thunderstorms?

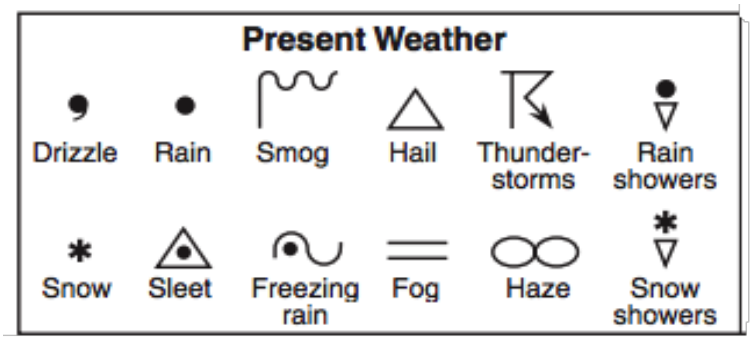
A)

B)



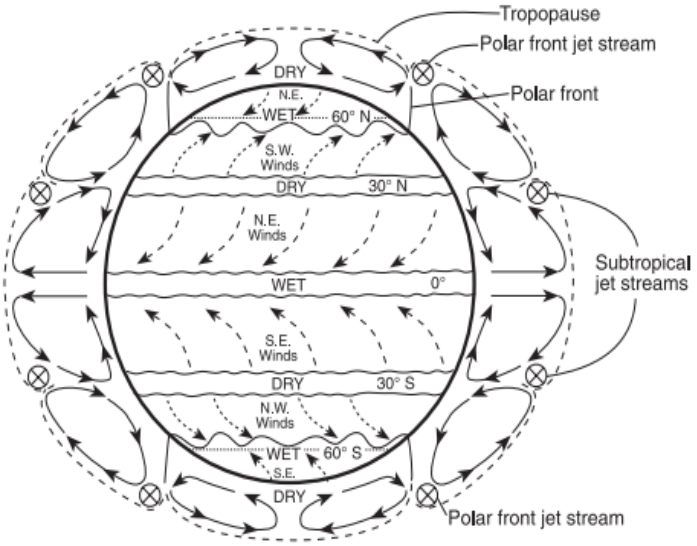
C)

D)



17. Using the diagram below in which planetary wind belt do most storms move toward the northeast?

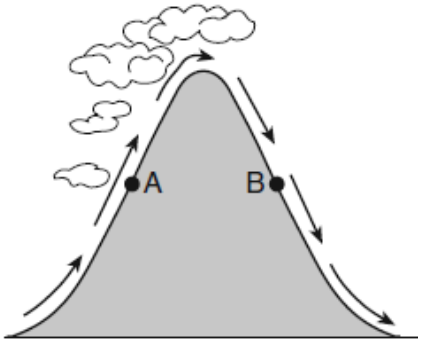
A). 30°N to 60°N
B) 0° to 30°N
C) 0° to 30°S
D) 30°S to 60°S



18. What is the general movement of surface winds in the northern hemisphere around the center of a low-pressure area?
A) counterclockwise and outward
B) counterclockwise and inward
C) clockwise and outward
D) clockwise and inward

19. Compared to air temperature and humidity at point A, the air temperature and humidity at point B are usually

A) cooler and drier
B) cooler and wetter
C) warmer and drier
D) warmer and wetter



20. Which natural event periodically weakens surface ocean currents in the equatorial Pacific Ocean, resulting in a change in air temperature and precipitation patterns in the United States?
A) El Nino
B) transpiration
C) ocean tides
D) volcanic eruptions

21. During the summer months, which change in location would most likely cause a decrease in the observed daytime air temperature?
A) from 45°N latitude to 20°N latitude
B) from sea level to 5km above sea level
C) from sea level on the windward side of a mountain to sea level on the leeward side
D) from the ocean coast to an inland location

22. El Cuy is a South American city located at 40°S. The first day of winter at this location occurs on June 21st. During which month would the coldest day of the year most likely occur at this location?
A) May
B) July
C) November
D) January

23. Based on the measurements below, which location has the greatest chance of precipitation?

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

Location	A	B	C	D
Air temperature (°F)	80	60	45	35
Dewpoint (°F)	60	43	35	33

24. Which processes lead to cloud formation when humid air rises over land?
A) compression, warming to the dewpoint, and condensation
B) compression, warming to the dewpoint, and evaporation
C) expansion, cooling to the dewpoint, and condensation
D) expansion, cooling to the dewpoint, and evaporation

25. Which instrument is used to measure wind speed?
A) anemometer B) wind vane C) psychrometer D) barometer

26. Which process of the water cycle occurs when water absorbs 2260 Joules of heat energy per gram?

A) melting of ice
B) condensation
C) evaporation
D) freezing

Properties of Water

Heat energy gained during melting	334 J/g
Heat energy released during freezing	334 J/g
Heat energy gained during vaporization	2260 J/g
Heat energy released during condensation	2260 J/g
Density at 3.98°C	1.0 g/mL

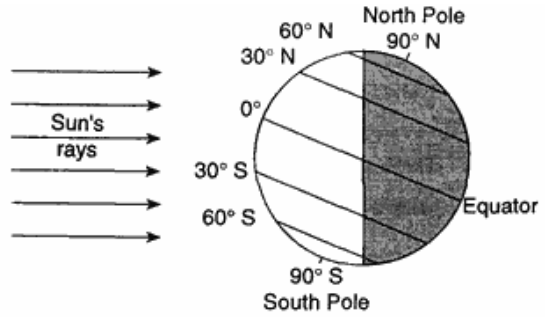
27. Which area is the most common source region for cold, dry air masses that move over New York and New Jersey?
A) North Atlantic Ocean
B) central Canada
C) Gulf of Mexico
D) central Mexico

28. Most of the air in the lower troposphere at the equatorial low-pressure belt is
A) warm, moist, and rising
B) warm, dry, and rising
C) cool, moist, and sinking
D) cool, dry, and sinking

29. During which time of the day would a shadow cast by a flagpole in New Jersey be the shortest?
A) sunrise B) noon C) sunset D) all equal

30. Which location will only have 9 hours of insolation on December 21st?

A) 90° N
B) 30°N
C) 30°S
D) 90°S

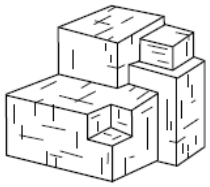


31. What do most igneous, sedimentary, and metamorphic rocks have in common?
A) They are formed from magma
B) They are produced by heat and pressure
C) They are composed on minerals
D) They exhibit crystals, banding, and distinct layers

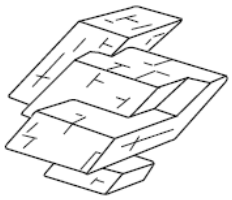
32. Trying to make a scratch in glass will aid in identifying which property of minerals?
A) color
B) hardness
C) tenacity
D) fracture

33. The crystal shape and type of cleavage of these two minerals below are determined by the

A) color and type of luster
B) streak and hardness
C) composition and atomic arrangement
D) density and magnetism



Crystal shape: cubic
Cleavage: three directions – all at right angles



Crystal shape: rhombohedral
Cleavage: three directions – *not* at right angles

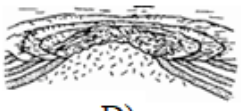
34. Which of the following sedimentary rocks could form as a result of evaporation of sea water?
A) conglomerate
B) sandstone
C) shale
D) halite

35. Which diagram shows an area in which fine-grained igneous rocks are most likely found?

A)

B)

C)



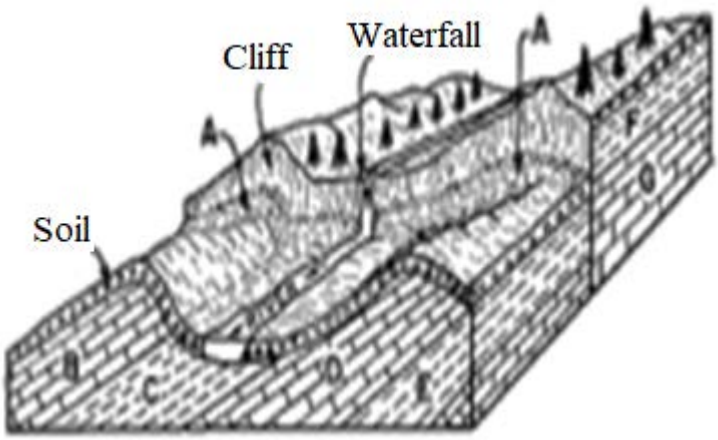
D)

36. The crystals of many metamorphic rocks are aligned in bands as a result of
A) earthquake faulting
B) cooling and solidification
C) mechanical weathering
D) heat and pressure

37. Which processes most often cause fossil evidence to be preserved in rock?
A) weathering and erosion
B) melting and faulting
C) deposition and cementation
D) folding and metamorphism

38. The waterfall in the diagram was most likely formed by

A) faulting
B) folding
C) volcanic activity
D) glaciation



39. Many parts of the rock record in New Jersey are missing. These parts are most likely missing because of

A) uplift and erosion
B) earthquakes and volcanic activity
C) subsidence and deposition
D) folding and faulting

40. Oxygen is the most abundant element by mass in the Earth's

A) inner core
B) troposphere
C) mesosphere
D) crust

41. Which layer of Earth's interior is inferred to be in a liquid state?

A) crust
B) mantle
C) outer core
D) inner core

42. Collisions between oceanic plates and continental plates are thought to result primarily from

A) hot liquid magma in the inner core
B) convection currents in the mantle
C) volcanic eruptions along coastlines
D) meteor impacts in the ocean basins

43. The arrows in the diagram below indicates the movement of two plates. This movement occurred along which type of plate boundary?

A) convergent
B) divergent
C) transform
D) complex

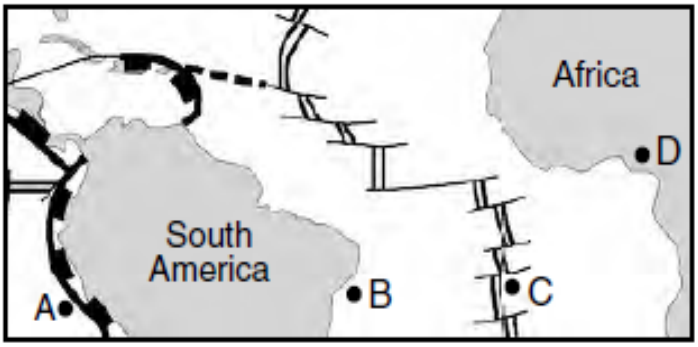
44. A landslide is an example of

A) wind abrasion
B) glacial deposition
C) wave action
D) mass movement

45. Island arcs are typically found along
A) Ridges B) hot spots C) trenches D) coastlines

46. Which location has the youngest bedrock due to sea floor spreading?

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

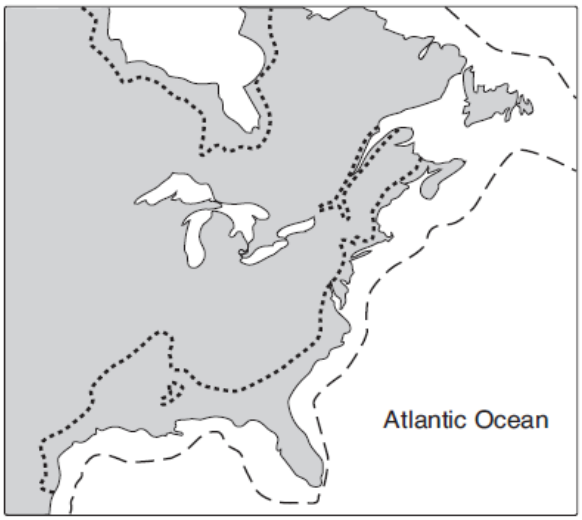


47. Which type of tectonic plate boundary is located at mid- ocean ridges?
A) transform C) convergent
B) divergent D) complex

48. Which landscape characteristic best indicates the action of glaciers?
A) few lakes
B) deposits of well-sorted sediments
C) residual soil covering large areas
D) polished and scratched surface bedrock

49. The downhill movement of mountain glaciers is primarily caused by
A) the force of gravity pulling on the glacier
B) snow blowing across the glacier
C) evaporation of ice directly from the glacier
D) water flowing over the glacier

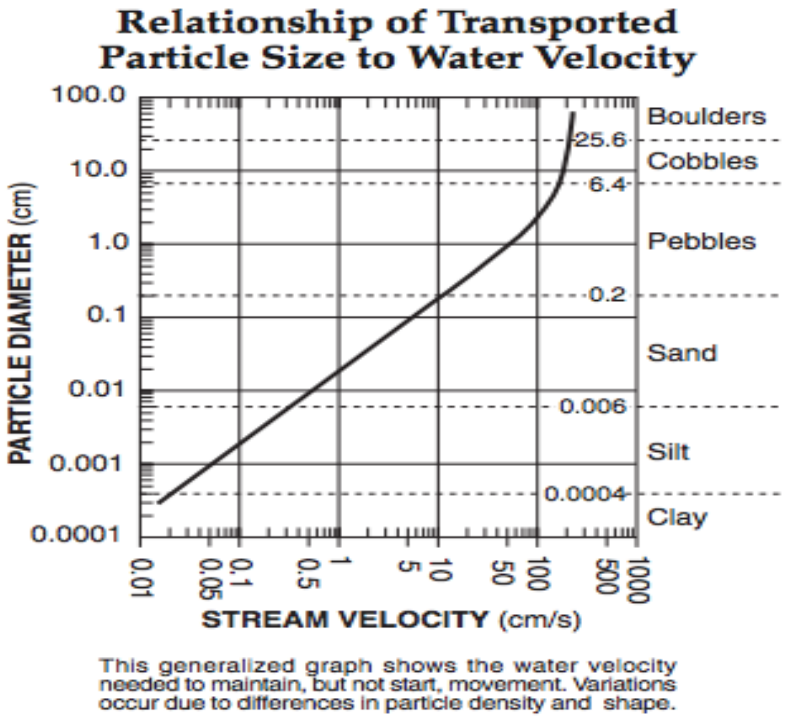
The map below shows part of the coastline of North America. Use the map with questions # 50 and 51.The solid line represents the present coastline. The line with a – – – – represents the coast line 18, 000 years ago. The future coast line being represented by - - - - - - - - .



50. Which statement below best explains why 18,000 years ago the coastline was at a different location than it is today?
A) The climate of the Earth was extremely hot and dry.
B) A large amount of the Earth's water was stored in large continental sheets of ice.
C) The east coast of North America was being subducted under the Euriasian Plate.
D) North America had just separated from Africa, and the Atlantic Ocean was forming.

51. What assumption is being made about the future position of the coastline?
A) the total amount of global precipitation will decrease
B) the thickness of the ozone layer will decrease
C) the concentration of carbon dioxide in the Earth's atmosphere will continue to increase
D) The rate of uplift of North American continent will increase.

52. Using the diagram below, which particles will be transported by a stream moving at a velocity of 5 cm/s?
A) pebbles, sand, silt, and clay, only
B) sand, silt, and clay, only
C) silt and clay, only
D) clay, only



This generalized graph shows the water velocity needed to maintain, but not start, movement. Variations occur due to differences in particle density and shape.

53. As a particle of sediment breaks into several smaller pieces, the rate of weathering of the sediment will
A) increase
B) decrease
C) remain the same

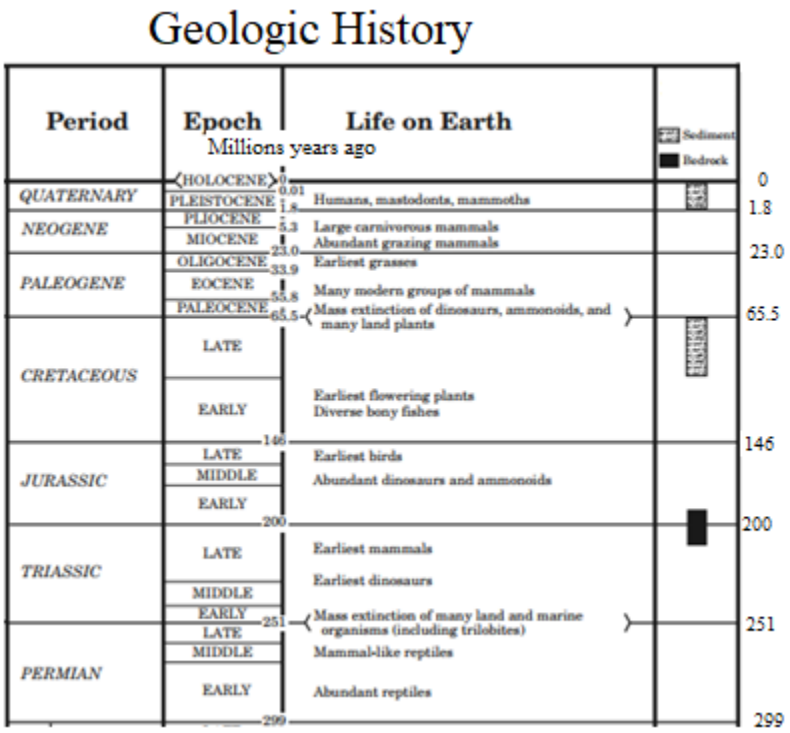
54. When a rock is crushed into a pile of fragments what occurs?
A) The total surface area decreases and chemical composition changes
B) The total surface area decreases, and the chemical composition remains the same
C) The total surface area increases and chemical composition changes
D) The total surface area increases and the chemical composition remains the same

Use the chart below to answer Questions 55 & 56.

55. Which one of these events below occurred earliest in Earth's History?

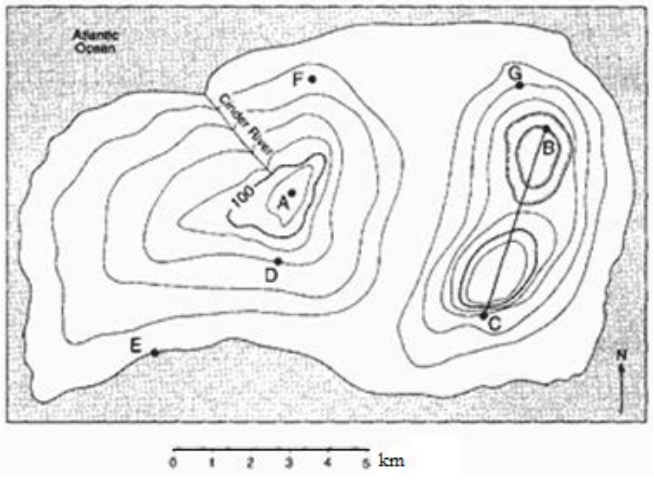
A) Earliest grasses
B) diverse bony fish
C) Earliest birds
D) Humans

56. Approximately how many years long did the Cretaceous Period last?
A) 20 million years
B) 40 million years
C) 60 million years
D) 80 million years



57. A bone sample contains only ¼ of its original Carbon- 14. How many half lives has Carbon gone through?
A) 0 half lives B) 1 half life C) 2 half lives D) 3 half lives

Use the topographic map of an island in the Atlantic Ocean below for questions 58 - 61. The contours are measured in meters.



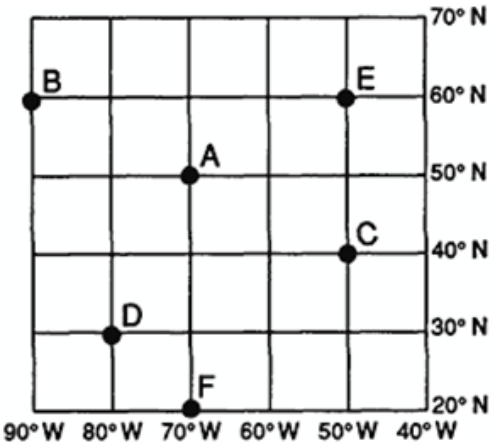
58. Which point is located on the steepest slope?
A) F
B) B
C) C
D) D

59. Which direction does the Cinder River Flow?
A) northwest C) southeast
B) northeast D) southwest

60. Which two points have the same elevaton ?
A) G and F C) C and D
B) B and D D) G and C

61. Which of the following is an approximate elevation for location "F".
A) 10m C) 33m
B) 22m D) 43m

Base your answer to questions 62- 65 on the diagram below. The map represents latitude-longitude coordinates.



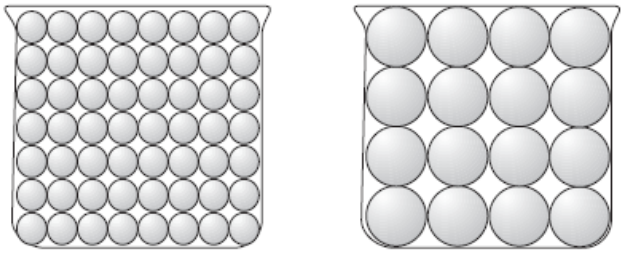
62. What is the compass direction from point D toward point E?
A) southwest
B) southeast
C) northwest
D) northeast

63. Points B & E would NOT have the same value for measurements of
A) time
B) latitude
C) duration of solar day
D) altitude of sun at solar noon

64. How are latitude and longtiude lines drawn on a globe of the Earth?
A) Latitude lines are parallel and longitude lines meet at the poles
B) Latitude lines are parallel and longitude lines meet at the Equator
C) Longitude lines are parallel and latitude lines meet at the poles
D) Latitude lines meet at the equator and longitude are parallel.

65. As a person travels from location B to location E the observed altitude of Polaris will
A) decrease B) increase C) remain the same

66. The diagrams below shows two identical containers with unifrom particles that were sorted by size. Which characteristic is most likey the same for these particle-filled containers?
A) infiltration rate B) water retention C) capillarity D) porosity



67. Which property of loose earth materials most likely increases as particle size decreases?
A) capillarity
B) infiltration
C) permeability
D) porosity

68. Apartment buildings and parking lots completely cover an area that was once an open, grass covered field. What factor most likely increased because of this construction?
A) capillarity
B) runoff
C) infiltration
D) water table levels

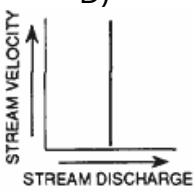
69. Which climate conditions most likely produce a landscape with rounded hills, large river valleys with many tributaries, and tropical vegetation?
A) cool and arid
B) cool and humid
C) warm and arid
D) warm and humid

70. Which graph best illustrates the relationship between stream velocity and stream discharge for a given portion of a stream channel?

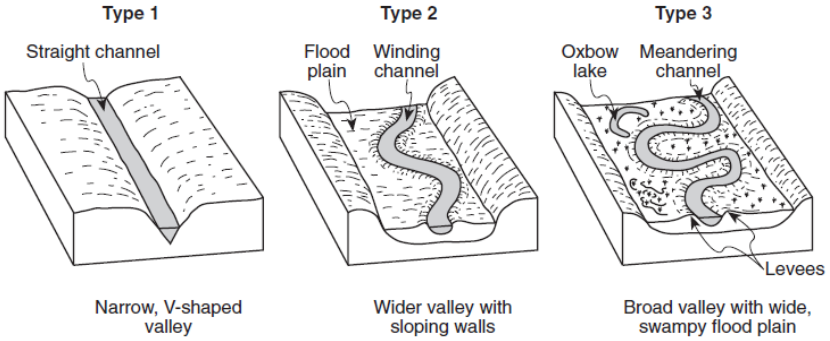
A)


B)


C)


D)


71. Which river system below is inferred to be the youngest, newest, and fastest river?
A) Type 1
B) Type 2
C) Type 3



72. Which natural agent of erosion is mainly responisble for the formation of barrier islands along the southern coast of Long Island and the New Jersey coast?
A) mass movement B) running water C) prevailing winds D) ocean waves

NEW JERSEY SCIENCE LEAGUE Corrected

EARTH SCIENCE EXAM ANSWER KEY TAN TEST

DATE: April 12, 2018

All schools and areas must finish the April exam and post mark or scan all results by April 30th.

1	D	19	C	37	C	55	C
2	B	20	A	38	A	56	D
3	B	21	B	39	A	57	C
4	C	22	B	40	D	58	C
5	C	23	D	41	C	59	A
6	A	24	C	42	B	60	C
7	D	25	A	43	C	61	C
8	C	26	C	44	D	62	D
9	B	27	B	45	C	63	A
10	C	28	A	46	C	64	A
11	A	29	B	47	B	65	C
12	C	30	B	48	D	66	D
13	D	31	C	49	A	67	A
14	D	32	B	50	B	68	B
15	B	33	C	51	C	69	D
16	D	34	D	52	B	70	C
17	A	35	C	53	A	71	A
18	B	36	D	54	D	72	D

Since some earth science courses in New Jersey start with geology, others with astronomy, and still others with meteorology, each of the four tests will include the following topics. Over time, this provides an equal opportunity to everyone. The number in parentheses indicates the approximate number of questions for that topic. The number per topic occasionally varies by one or two, but usually does not.

Geology (Approximately 44 question)

Minerals (4)
Rocks (2)
Earth Structure (2)
Plate Tectonics (4)
Faults/Folds/Seismology (3)
Vulcanism (2)
Glaciation/Deserts (2)
Rivers: Erosion & Deposition (3)
Ground Water/Caves (2)
Ocean Shore Line/Currents/Salinity(3)
Weathering/Mass Wasting (2)
Historical Geology (4)
Map Reading: Road/Topo/Geologic (4)
Geodesics/Time/Map Projections (3)

Astronomy (approximately 14 Questions)

Sun (2)
Moon (2)
Sun-Moon-Earth System (3)
Solar System (3)
Stars (2)
Galactic Systems (2)
Cosmology (2)

Meteorology (Approximately 14 Questions)

Insolation/Temperature/Air Masses (3)
Atmospheric Pressure/Highs/Lows (4)
Moisture in the Atmosphere (3)
Frontal Systems (3)
Interpreting Weather Maps (3)

Dates for 2018 Season

Thursday April 12, 2018

All schools and areas must finish the April exam and post mark or scan all results by April 30th.

New Jersey Science League
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phone # 908-213-8923 fax # 908-213-9391 email: newjsl@ptd.net
Web address: http://entnet.com/~personal/njscil/html/

What is to be mailed back to our office?

PLEASE RETURN THE AREA RECORD AND ALL TEAM MEMBER SCANTRONS
(ALL STUDENTS PLACING 1ST, 2ND, 3RD, AND 4TH).
If you return Scantrons of alternates, then label them as ALTERNATES.

Dates for 2019 Season

Thursday January 10, 2019 Thursday February 14, 2019
Thursday March 14, 2019 Thursday April 11, 2019