

**DIAGNOSTIC TEST IN EARTH SCIENCE**  
**SY 2022-2023**

**Instructions:** Read each question carefully and shade the correct answer in the answer sheet provided to you. Do not write anything on this test questionnaire.

1. Earth is the planet we live on, and the only place in the universe known to support life. Which of the following statements accurately describes this characteristic?
  - A. It has soil where trees grow.
  - B. It has trees that provide oxygen.
  - C. It has liquid water in the surface.
  - D. It is a home to a variety of complex organisms.
  
2. Which of the following factors are required for an organism to survive on Earth?
  - I. Earth has an atmosphere and ozone layer.
  - II. Earth has both water cycle and nitrogen cycle.
  - III. Earth has natural activities to circulate nutrients.
  - IV. Earth can protect the organism from any possible threat.
  - A. I & II only
  - B. I & III only
  - C. I, II, III only
  - D. I, II, III, & IV
  
3. What makes human and other living organisms capable to live on Earth?
  - A. Earth can provide food for the organism.
  - B. Earth can protect the organism from any possible threat.
  - C. Earth's temperature is mostly hot compared to other planets.
  - D. Earth has the right amount of temperature, water, good atmosphere, and favorable climate.
  
4. You observed an Earth-sized like planet in a distant galaxy. Based on the data, the planet is at the same distance from its star, like Earth to its star-the sun. It is also covered with a thick atmosphere which is composed of carbon dioxide and shows no volcanic activity. What can you infer from these data?
  - A. The Earth-like planet is hot and nutrient cycling occurs.
  - B. The Earth-like planet is cold and nutrient cycling occurs.
  - C. The Earth-like planet is hot and no nutrient cycling occurs.
  - D. The Earth-like planet is cold and no nutrient cycling occurs.

5. What subsystems are interacting when carbon dioxide dissolves from the air into the ocean?
- A. Atmosphere and biosphere
  - B. Atmosphere and lithosphere
  - C. Atmosphere and hydrosphere
  - D. Atmosphere and lithosphere
6. During the 1800's, miners can identify real gold from pyrite through biting the surface of the mineral. If a bite mark is exhibited, then the said mineral is considered real gold. What property is tested in this scenario?
- A. Cleavage
  - B. Luster
  - C. Hardness
  - D. Streak color
7. While walking at the beach, Angela found a rock sample with shells and pebbles embedded. What type of rock did she find?
- A. Igneous rock
  - B. Metamorphic rock
  - C. Sedimentary rock
  - D. Ore body rock
8. A mineral is inorganic. Which of the following supports this statement?
- A. Minerals is uniform in appearance and is in solid state of matter
  - B. Any material that is formed in laboratories is not considered a mineral
  - C. Bones, shells, teeth and other hard parts of an organism are not minerals
  - D. Both graphite and diamond are made up of carbon but their carbon atoms are arranged differently.
9. Imagine that you work at a jeweler's shop and someone brings in some "gold nuggets" that they want to sell. The person claims that an old prospector found the gold nuggets during the gold rush. You are not sure if the nuggets are real gold. Which identification tests would you do to help you decide the nuggets' identity?
- A. Vinegar test
  - B. Hallmark test
  - C. Nitric acid test
  - D. All of the above
10. Fossil fuels are derived from which of the following sources?
- A. Organic matter on the crust surface
  - B. Organic matter trapped in igneous rock
  - C. Organic matter trapped in sedimentary rock
  - D. Non-organic matter trapped in metamorphic rock

11. Based from the Department of Energy 2017 power statistics, coal is the main source of energy in the Philippines. What do you think might happen if coal reserves run out?
- A. It will result to decreasing number of air pollutants.
  - B. It will decrease the energy resources present in the Philippines.
  - C. It will not affect Philippines economy because it is an infinite resource.
  - D. It will decrease the number of air pollutants and energy resources in the country.**
12. How does geothermal energy work?
- A. Uses water from the earth
  - B. Uses potential energy
  - C. Uses heat from the core of earth**
  - D. Uses heat from atmosphere
13. People have a long history of using the force of water flowing in streams and rivers to produce mechanical energy. Which of the following best describes the aforementioned statement?
- A. Milling**
  - B. Cutting
  - C. Sewing
  - D. Molding
14. Which of the following is NOT true about the impact of geothermal energy resource to the environment?
- A. The construction of geothermal power plants destroys natural habitat disrupting ecological niche.**
  - B. Geothermal features in national parks, such as geysers and fumaroles, making the site promotes sustainability.
  - C. Geothermal power plants do not burn fuel to generate electricity, so the levels of air pollutants they emit are low.
  - D. Most geothermal power plants inject the geothermal steam and water that they use back into the earth for recycling purposes.
15. Which of the following best indicates the electricity generation from hot water geothermal source?
- A. Drilling well → hot water → generator → steam
  - B. Drilling well → hot water → steam → generator**
  - C. Generator → hot water → steam → Drilling well
  - D. Generator → steam → hot water → Drilling well

16. Hydropower, or hydroelectric power, is one of the oldest and largest sources of renewable energy, which uses the natural flow of moving water to generate electricity. Knowing this made you preferable to build hydropower plant over the other because which do you think are your reasons?

- I. It does not generate greenhouse gases and other emissions.
- II. It has an extremely long life and the technology is highly reliable
- III. It is extremely efficient, with 90% of the water's energy converted into electricity.
- IV. Dams can damage or otherwise impact the environment both upstream and downstream through their construction process

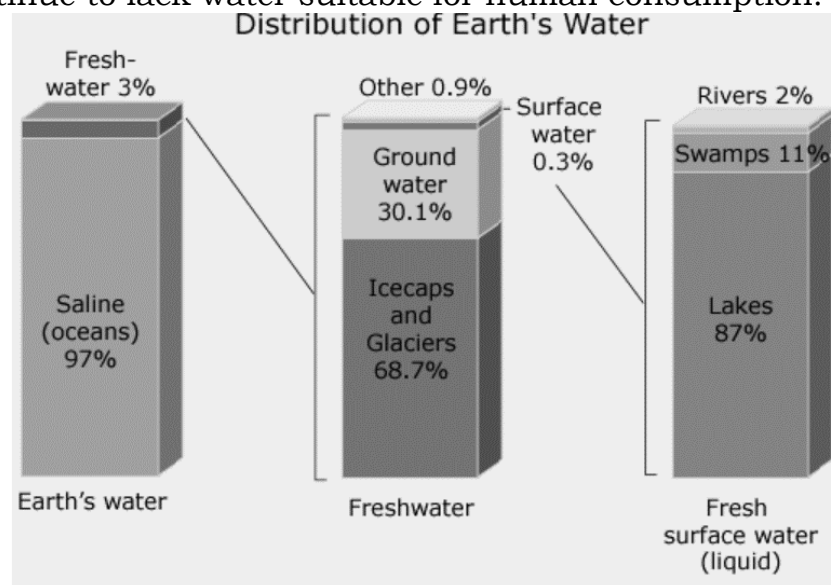
A. I, II, III only

B. I, II, IV only

C. I, III, IV only

D. I, II, III, IV

17. Water covers about 71% of the earth's surface. Despite its abundance, we continue to lack water suitable for human consumption.



In relation to the circumstance, which of the following options is **TRUE**?

- I. Most fresh water are stored in ice caps, glaciers, ponds, lakes, rivers, streams, and underground water.
- II. Most Earth's water is saline water
- III. Surface water is more abundant than ground water.

A. Only statement III is false.

B. Only statement I is true.

C. Statements I and III are true.

D. Statements I and II are false

18. What is the massive driver of pollution?
- A. Population
  - B. Urbanization
  - C. Development
  - D. Climate change
19. Water conservation is the practice of using water efficiently to reduce unnecessary water usage. Which activity should you AVOID for us not to contribute WASTE the **MOST** per day at home?
- A. Running the tap while washing dishes
  - B. Using a garbage disposal
  - C. Long showers
  - D. A leaky toilet
20. Which of the following ways can protect and prevent depletion of the soil?
- A. Fertilization
  - B. Afforestation
  - C. Monitor Growth
  - D. Control Storm Water
21. In what way you can help maintaining the soil moisture content?
- A. by planting trees
  - B. by applying fertilizers
  - C. by applying pesticides
  - D. by planting crops and applying fertilizers
22. The Philippine Clean Water Act of 2004 known as Republic Act No. 9275 is an act providing for a comprehensive water quality management which aims to protect the country's water bodies from pollution. Which of the following activities and its purpose is falsely stated?
- A. Use of water for domestic purposes - means the utilization of water for drinking, washing, bathing, cooking or other household needs, home gardens and watering of lawns or domestic animals;
  - B. Use of water for irrigation - means the utilization of water for producing agricultural crops;
  - C. Use of water for livestock raising - means the utilization of water for recreational purposes.
  - D. Use of water for municipal purposes - means the utilization of water for supplying water requirements of the community.
23. How do you assess the impact of soil cultivation?
- A. It does have an impact, only positive.
  - B. It negatively impacts our soil due to putting fertilizer in the soil.
  - C. It positively impacts our soil due to putting fertilizer and herbicide in the soil.
  - D. It is positive in the sense that it provides needed resources. However, it negatively impacts our soil due to pollution and causes desertification.

24. Which of the following agricultural techniques or farming practices below involves immediately depositing seeds into untilled soil that has retained previous crop residues?
- A. Cover crops
  - B. Crop rotation
  - C. No-till farming
  - D. Contour plowing
25. Solid Waste Management (SWM) is considered to be one of the most serious environmental issues in the Philippines. What legal basis provide the necessary policy framework, institutional mechanisms and mandate to the local government units (LGUs) to achieve 25% waste reduction through establishing an integrated solid waste management plans based on 3Rs (reduce, reuse and recycling)?
- A. The Republic Act (RA) 9003, otherwise known as the Ecological Solid Waste Management Act of 2000
  - B. Integrated Waste management Plan of Environmental Protection Agency
  - C. Philippine Regulations on Sanitation and Wastewater Systems
  - D. The 2030 Sustainable Development Goal
26. In times of Covid-19 pandemic, many people used facemasks to protect themselves. As a responsible citizen, in which type of waste you are going to classify used facemasks?
- A. Solid waste
  - B. Liquid waste
  - C. Organic waste
  - D. Hazardous waste
27. Sanitary and municipal fills and waste heaps are unavoidable hazardous due to the following factors.
- 1. Leachate
  - 2. Emanating gases
  - 3. Rodents and wandering animals
  - 4. Automobile workshops that seem to have an affinity for such neighborhoods
- Which of the above are correct?
- A. 1 and 4 only
  - B. 1 and 2 only
  - C. 2 and 3 only
  - D. 3 and 4 only

28. What do you call that process which exhibits the breaking down of rocks on the earth's surface that may cause changes in its composition?
- A. Erosion
  - B. Deposition
  - C. Mass wasting
  - D. Weathering
29. A marble statue of our national hero, Dr. Jose P. Rizal that is situated in your hometown Plaza is left exposed to the weather. Within a few years, the details on the statue have begun to weather away. What is the probable cause of this weathering?
- A. Abrasion
  - B. Lichens
  - C. Oxygen in the air
  - D. Carbonic acid in rainwater
30. Why do geologists call on convection, rather than conduction, in order for heat to transfer from the core to the crust?
- A. Conduction of heat is far too fast and efficient relative to convection, so the Earth would have cooled completely by now.
  - B. Conduction of heat is far too slow, but efficient relative to convection, so the Earth would have cooled almost completely by now.
  - C. Conduction of heat is far too slow and inefficient relative to convection, so the Earth would not have produced much cooling thus far.
  - D. Conduction of heat is far too fast and inefficient relative to convection, so the Earth would heat up to a higher temperature than it is now.
31. Your father just got a promotion and his already high salary was even doubled but you family had to move to Camiguin island several kilometers away from Mount Hibok-hibok which is an active volcano. Having known that you live near an active volcano, what information should you know and preparations should you take in case the volcano will show signs of eruption?
- A. Interview local community folks in the island about the past eruptions of the volcano and asked what they did.
  - B. Check out the website of PHILVOLCS and read on the past eruption history of Mt. Hibok-Hibok from your local library.
  - C. Search the internet or other resources for pertinent data about Mt. Hibok-Hibok, talk to long-time residents or officials in the area, and discuss with your family a possible volcanic disaster preparedness plan.
  - D. Be prepared for a possible volcanic eruption by keeping and regularly maintaining a bag of clothes, footwear, non-perishable goods, bottled water, toiletries, flashlight, batteries, and cash which is always ready to carry anytime.



32. What sequence of rock types will shale pass through with successively higher grades of metamorphism?
- A. Shale, phyllite, gneiss, slate, schist, partial melting.
  - B. Shale, phyllite, slate, schist, gneiss, partial melting.
  - C. Shale, slate, phyllite, gneiss, schist, partial melting.
  - D. Shale, slate, phyllite, schist, gneiss, partial melting.**
33. The picture below shows a rock with deformed structure and intergrown crystals. What rock was probably formed?



Figure 5. Rock Sample

- A. Sediments that were deposited on the ocean floor
  - B. Heat and pressure that changed a preexisting rock**
  - C. Volcanic lava that cooled on Earth's surface
  - D. A meteor impact on Earth's surface
34. What happened to the rocks under shear stress?
- A. The rocks are squeezed.
  - B. The rocks fold or fracture.
  - C. The rocks are pulled apart.
  - D. The rock walls slip to each other on opposite direction.**
35. Lino played a clay bar. He pushed the two sides of the clay bar using equal force from her hands on the same axis. What do you think is the type of stress did he exert on the clay bar?
- A. Direct stress
  - B. Shear stress
  - C. Tensional stress
  - D. Compressional stress**
36. Which of the following statement supports the reason of shrinking of the Pacific Ocean?
- A. The plates are converging
  - B. Water is evaporating quickly near the equator
  - C. It has less glaciers melting into it than the Atlantic
  - D. Ocean crust in the Pacific is getting recycled faster than it's being created**



37. The San Andreas Fault System is a continental transform fault that extends roughly 1,200 kilometers (750 mi) through California. It forms the tectonic boundary between the Pacific Plate and the North American Plate . How would you describe the geologic process on how it was formed?

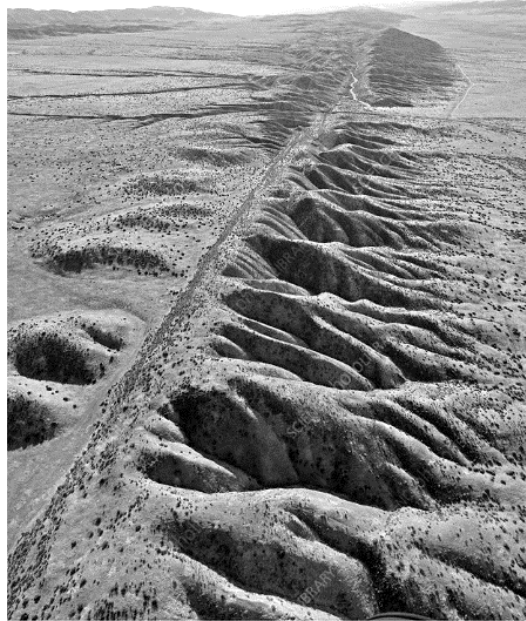


Figure 3. San Andreas Fault  
<https://bit.ly/3CpUTAQ>

- A. It is a convergent plate boundary resulting from two tectonic plates moving toward each other
- B. It is a transform-plate boundary resulting from two plates sliding past each other, horizontally
- C. Divergent Plate Boundary resulting from two tectonic plates moving away from each other.
- D. Hot Spot resulting from intensely hot area in the mantle below Earth's crust.

38. How can you infer the difference between a guyot and a seamount?

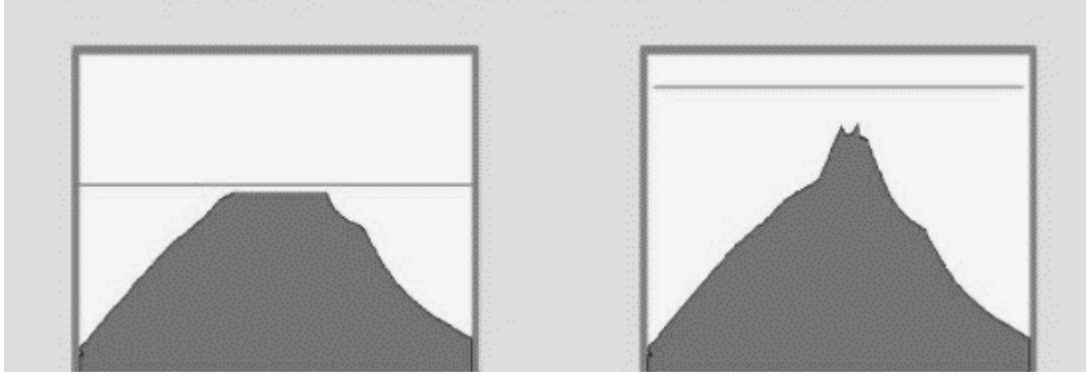


Figure 3. Guyot (left) and Seamount (right)  
<https://bit.ly/3HQ8eDY>

- A. Seamounts at one point reached the surface and was eroded away by wind and waves but guyots kept its mountain like shape.
  - B. Guyots at one point reached the surface and was eroded away by wind and waves but seamount kept its mountain-like shape.
  - C. Seamounts are cone shaped volcanoes, and biologically, that would scientifically confirm that there is no difference from guyots
  - D. Seamount have been weathered by wave and becomes a guyot, a cone shaped volcano
39. Which of the following resulted to the formation of new crust from magma that rises to the earth's surface between two plate boundaries?
- A. Strike fault
  - B. Divergent boundary
  - C. Transform boundary
  - D. Convergent boundary
40. Which of the following is associated with the discovery of seafloor spreading?
- A. Mountains and Volcanoes are denser than mantle
  - B. Rotational pole of the earth has migrated or moved.
  - C. The crust of the continents is denser than the crust of the ocean
  - D. The crust of the oceans is very young relative to the age of the crust of the continents.

41. The diagram below shows a drill core of sediment that was taken from the bottom of a lake

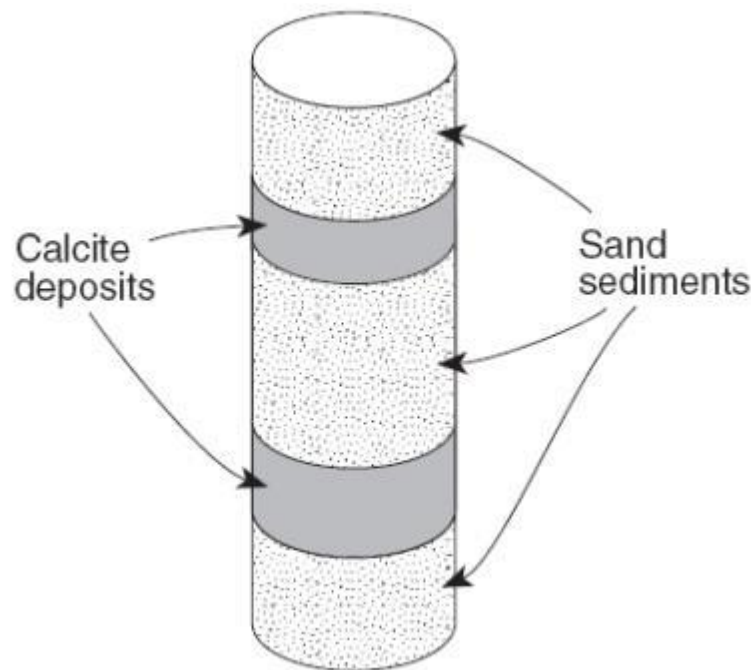


Figure 4. Drill Core of Sediments

<https://bit.ly/3GXHosT>

Which types of rock would most likely form from compaction and cementation of these sediments?

- A. Shale and coal
  - B. Breccia and rock salt
  - C. Sandstone and limestone
  - D. Conglomerate and siltstone
42. Which statement best describes the processes of weathering and erosion?
- A. Weathering and erosion are directly responsible for the amount of water in a river that transports sediments to the sea.
  - B. Weathering and erosion are directly responsible for the transportation, deposition and compaction of loose sediments on the seafloor
  - C. Weathering and erosion are directly responsible for depositing loose sediments on the bottom of the ocean, forming layers of sediment
  - D. Weathering and erosion are directly responsible for the breakdown of any type of rock into smaller particles and the carrying away of the loose sediments
43. Radiometric dating, often called radioactive dating, is a technique used to determine the age of materials such as rocks. What is being measured in radiometric dating?
- A. the amount of the parent isotope only
  - B. when the dated mineral became part of a sedimentary rock
  - C. the time of crystallization of a mineral containing an isotope
  - D. the time when the radioactive isotope formed, prior to being incorporated into a mineral.

44. If you are a geologist, how does the principle of faunal succession allow you to correlate rock strata in different geographic locations?
- A. It states that layers of rock strata at different locations can be correlated according to the unique set of fossils they contain.
  - B. It states that the fossils in rock strata are older than the rock layers, allowing geologists to link younger and older layers across a region
  - C. It states that the evolution of fossils in one region should correlate with the evolution of fossils through different rock strata in another region
  - D. It states that fossils within rock strata are mostly homogeneous, suggesting that rock strata throughout a region should reveal similar sets of fossils.
45. The age of the Earth is based on the radioactive isotopic dating of meteorites. How old is the Earth based on its history?
- A. 4.3 billion years old
  - B. 4.4 billion years old
  - C. 4.5 billion years old
  - D. 4.6 billion years old
46. You are having your vacation then suddenly while on the road trip you see this amazing rock formation shown in Figure 1 below. Which of the following principles of relative dating is **NOT** used in determining whether the rocks are of the same age?



Figure 1. Animasola Rock Formation in Masbate  
<https://www.san-andres.info/wp-content/uploads/2018/07/animasola2.jpg>

- A. Inclusion
- B. Superposition
- C. Lateral Continuity
- D. Original Horizontality

47. Which conclusion can be made when observing fossils buried in a different layer of rock?
- A. Shallow layers are older fossils than the deeper layers
  - B. The deeper layers are older fossils than the shallow layers**
  - C. The deeper layers are younger fossils than the shallow layers
  - D. Shallow layers are the same age fossils with the deeper layers
48. Index fossil is an abundant and easily identifiable fossil with a wide geographic distribution and a short geologic range. From figure 5 below, which animal fossils are considered index fossils?

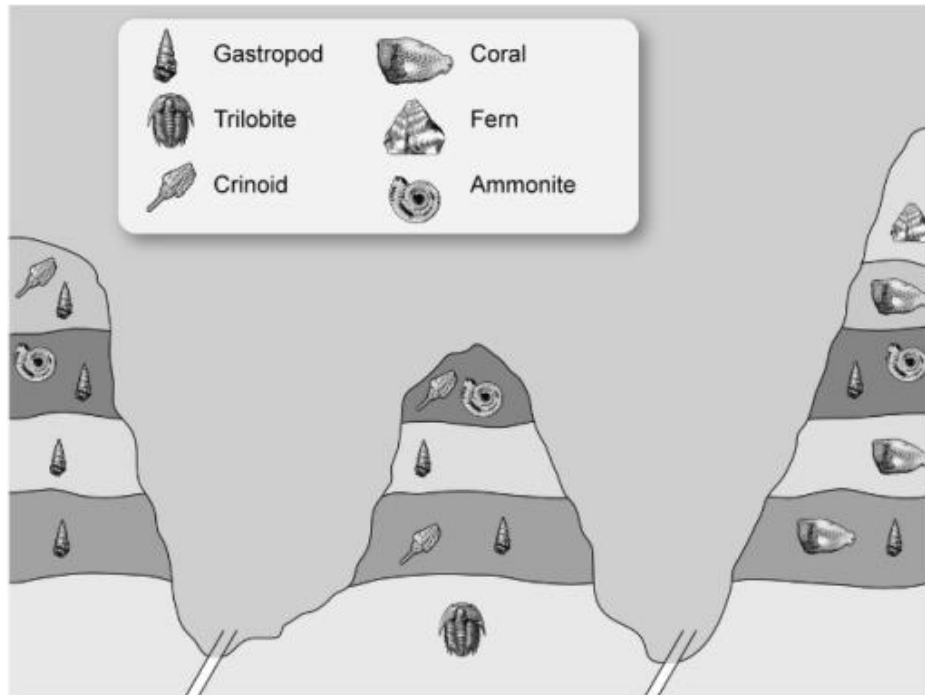


Figure 5: Various Fossils in Layers  
<https://commons.wikimedia.org/wiki/File:Fossils.png>

- A. Fern
  - B. Coral
  - C. Trilobite
  - D. Ammonite**
49. Which era were dinosaurs, small mammals, flowering plants, and birds found?
- A. Cenozoic
  - B. Mesozoic**
  - C. Paleozoic
  - D. Quaternary
50. A fossil of an ancient fish was dug up along with fossilized leaves of fern-like plants. In which environment was this fossil probably formed?
- A. Hot jungle
  - B. Arctic sea
  - C. Hot dessert
  - D. Warm swamp**