

**DIAGNOSTIC TEST IN EARTH AND LIFE 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. Which refers to the only planet in the solar system that gave rise to complex life?
  - A. Earth
  - B. Mars
  - C. Mercury
  - D. Venus
  
2. Major human activities cause great destructions on Earth's subsystems. Since energy and matter is cycled within the spheres and being part of the system, these harmful activities bring forth destruction to us in a boomerang effect. One example of this is the Global warming. As a student, what recommendation can you give to solve this problem?
  - A. Report the violators to the United Nations.
  - B. Just ignore and continue your daily routines.
  - C. Be active in advocating change by rallying outside government hall.
  - D. Start the change from yourself by not contributing pollution to the environment.

For items 3-4, refer to the chemical formula and property of the minerals presented in the table below.

**Table 1.** Chemical formula and property of the minerals

	Minerals	
	Olivine	Hematite
<b>Chemical formula</b>	(Mg,Fe) <sub>2</sub> SiO <sub>4</sub>	Fe <sub>2</sub> O <sub>3</sub>
<b>Hardness (max)</b>	7	6

3. Which of the following inference can be made about the two minerals?
  - A. Olivine can scratch hematite.
  - B. Hematite can scratch olivine.
  - C. The two minerals can scratch each other.
  - D. Neither of the two could scratch the other.
  
4. Which chemical groups do these two minerals belong?
  - A. Olivine = oxide; hematite = sulfate
  - B. Olivine = silicate; hematite = oxide
  - C. Olivine = sulfate; hematite = oxide
  - D. Olivine = oxide; hematite = silicate

5. Which of these areas do most sedimentary rocks usually form?
  - A. Volcanoes
  - B. Mountains
  - C. Plain lands
  - D. Bodies of water
  
6. Which of the following correctly describes physical weathering?
  - A. Rust changes the color of the rock.
  - B. A carabao steps on and crushes a limestone.
  - C. A year of acid rain deforms a rock monument.
  - D. Running water transports rock to other places.
  
7. Which of the following terms refers to the thickest layer, made mostly of iron, magnesium, and silicon, that is dense, hot, and semi-solid?
  - A. Core
  - B. Crust
  - C. Lithosphere
  - D. Mantle
  
8. Which of the following statements correctly describes inner core and outer core?
  - A. The inner core is extremely dense which made up of solid iron and is intensely hot, while the outer core is the thickest layer, made mostly of magnesium and silicon.
  - B. The inner core is the thickest layer, made mostly of magnesium and silicon, while the outer core is made from iron and nickel in liquid form, heated largely by radioactive decay.
  - C. The inner core is extremely dense which made up of solid iron and is intensely hot, while the outer core is made from iron and nickel in liquid form, heated largely by radioactive decay.
  - D. The inner core is made from iron and nickel in liquid form, heated largely by radioactive decay, while the outer core is extremely dense which made up of solid iron and is intensely hot.

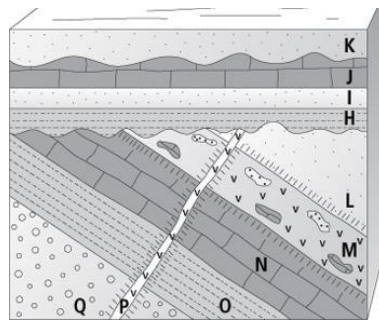
For items 9-10, refer to the table 1 below.

**Table 2.** Difference in Composition of Granitic and Basaltic

Typical Granitic Magma	Typical Basaltic Magma
70% silica- felsic	50% silica- mafic
10-15% water	1-2%water
Intrusive	Extrusive

9. When the magma is formed, it rises toward the Earth's surface. But not all magma behaves in the same way, just like granitic and basaltic magma. Based on the table, which of the following statements correctly differentiate granitic and basaltic magma?
- A. Granitic magma is composed of 70% silica and 10-15% water, while basaltic magma is composed of 50% silica and 1-2% water.
  - B. Granitic magma is composed of 50% silica and 10-15% water, while basaltic magma is composed of 70% silica and 1-2% water.
  - C. Granitic magma is composed of 70% silica and 1-2% water, while basaltic magma is composed of 50% silica and 10-15% water.
  - D. Granitic magma is composed of 50% silica and 10-15% water, while basaltic magma is composed of 70% silica and 10-15% water.
10. Which from the following statements below correctly conclude the movement of both basaltic and granitic magma toward the Earth's surface?
- A. Basaltic magma typically solidifies within the Earth's crust, while granitic magma rises all the way to the Earth's surface to erupt from a volcano.
  - B. Basaltic magma rises all the way to the Earth's surface to erupt from a volcano, while granitic magma typically solidifies within the Earth's crust.
  - C. Neither basaltic magma nor granitic magma rises all the way to the Earth's surface to erupt from a volcano bringing great destruction to the environment.
  - D. Both basaltic magma and granitic magma rise all the way to the Earth's surface to erupt from a volcano, and at the same time solidify within the Earth's crust.
11. Which of the following combination of factors can change pre-existing rocks into new forms?
- A. Color, shape, and texture
  - B. Minerals, color, and temperature
  - C. Texture, temperature and chemically- active fluids
  - D. Temperature, pressure and chemically- active fluids
12. You watched a video of a lava flow when suddenly you got curious about how crystal formation happens. You also observed that small and large crystals can be formed from a lava flow. Based on this observation, where would you expect to find the largest crystals in a lava flow?
- A. At the center of the flow.
  - B. Near the bottom of the flow.
  - C. Near the top surface of the flow.
  - D. The crystals would have the same grain size throughout the flow.

13. You were given a granite sample and tasked to describe just by looking and touching it. Which of the following statements below will best describe a granite based on its physical appearance?
- Light- colored, fine- grained igneous rock rich in silica
  - Light- colored, fine- grained igneous rock poor in silica
  - Light- colored, coarse- grained igneous rock rich in silica
  - Light- colored, coarse- grained igneous rock poor in silica
14. You are walking along a flat rock surface. You discover that as you walk further, the age of the rocks decreases until you reach the middle of the surface, then for some reason, they get older again. What structure have you just passed over?
- syncline fold
  - anticline fold
  - monocline fold
  - overturned fold
15. A geologist was interested in the age of rock layers in a specific area, as shown in Figure 1 below.



*Figure 1. Sample Cross-section of Stratified Rocks*

(Source: <https://eastmontscience.weebly.com/uploads/1/3/3/8/13389395/2550116.jpg>)

Which of the following set of rock layers is correctly arranged from oldest to youngest?

- P – O – N – M – L – Q
  - P – Q – O – N – L – M
  - Q – O – N – M – L – P
  - Q – P – O – N – M – L
16. A geologist used relative dating methods to guess that an igneous rock sample is between 1 million and 5 million years old and was curious about its exact age. Will using carbon-14 in determining the age of the rock be helpful?
- Yes, because the rock sample contains traces of carbon in it.
  - Yes, because carbon-14 is widely used by scientists in absolute dating.
  - No, because the half-life of carbon-14 is too short for the age of the rock sample.
  - No, because it is not sure whether dead bodies of organisms are present in the sample.

17. A geologist found a dinosaur fossil and wants to estimate what period that dinosaur existed in the past. The geologist measured the ages of the rocks beneath and above the fossil. What dating technique he/she is about to use?
- A. cross dating
  - B. relative dating
  - C. geologic dating
  - D. absolute dating
18. What information is generally shown in the geologic time scale?
- A. the branches of geology
  - B. the geologic history of the Earth
  - C. the geologic features of the Earth
  - D. the geologists with significant contributions
19. Which hazard may happen if loosely-packed and water-logged sediments at or near ground surface lose strength during earthquakes?
- A. eruption
  - B. fire
  - C. liquefaction
  - D. tsunamis
20. A barangay located near the sea experienced a magnitude 8.0 earthquake. What hazard are the residents most exposed to after this?
- A. eruption
  - B. fire
  - C. liquefaction
  - D. tsunami
21. What term refers to an extreme natural phenomenon in Earth's crust, like earthquakes and volcanic eruptions, that may cause danger to life and property?
- A. geologic hazard
  - B. biological hazard
  - C. technological hazard
  - D. hydrometeorological hazard
22. If you live on a hillside in a land-locked area with an active volcano nearby, which of the following phenomena does NOT bring you hazard?
- A. tsunami
  - B. landslide
  - C. earthquake
  - D. volcanic eruption

23. Who among the following people is doing an activity that helps lessen the occurrence of landslides?
- A. Person L constructs their home on a steep slope.
  - B. Person M puts as much vegetation as possible on the nearby slope.
  - C. Person N creates a water canal that cuts through some part of the hill.
  - D. Person O gathers topsoil from the mountain for their backyard garden.
24. During a typhoon, you noticed an abnormal rise of seawater level that caused flooding in the coastal area you are living in. What phenomenon had you just witnessed?
- A. tornado
  - B. tsunami
  - C. spring tide
  - D. storm surge
25. Suppose you live in a coastal area and your primary source of drinking water has always been through a water pump. Over the years, you noticed that the water gets saltier and saltier. What coastal process could have occurred?
- A. tidal wave
  - B. coastal erosion
  - C. saltwater intrusion
  - D. coastal submersion
26. A businessman wanted to build a five-story hotel a few meters away from the edge of a cliff on the shore. Should this plan be allowed by the authority?
- A. Yes, it will boost tourism in the community.
  - B. Yes, it is the best spot to capture beautiful sceneries.
  - C. No, its construction could only worsen coastal erosion.
  - D. No, the businessman needs to have large amount of investment.
27. Miller and Urey performed an experiment to prove the origin of life. What are the mixtures of gases they thought to be abundant in earth's early atmosphere?
- I. N<sub>2</sub>
  - II. H<sub>2</sub>O
  - III. H<sub>2</sub>
  - IV. NH<sub>3</sub>
  - V. O<sub>2</sub>
  - VI. CH<sub>4</sub>
- A. I, II, III, IV
  - B. II, III, IV, V
  - C. II, III, IV, VI
  - D. III, IV, V, VI

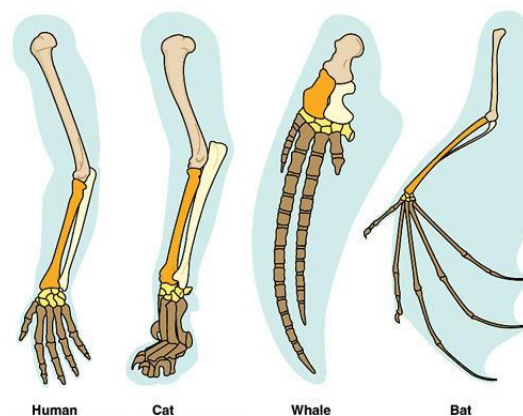
28. Which of the following conditions will best fossilize an animal?
- A. The animal is made up of bones.
  - B. The animal is soft-bodied like jellyfish.
  - C. The animal dies at sea and sinks deep.
  - D. The animal is left exposed to the elements.
29. Based on the Geologic Time Scale, which of the following is a correct pair of periods in the Earth's history and the corresponding major event that took place?
- A. Quaternary – age of mammals
  - B. Permian – extinction of trilobites
  - C. Cretaceous – appearance of first land plants
  - D. Cambrian – appearance of first amphibians
30. On a hot day, a man feels to go for a swim, drinks some cold water, or sits in the shade while on a cold day, he feels to put on a coat, sits in a corner, or eats a bowl of hot soup. Given the situation, how would you classify the interaction of the man to his environment?
- A. It is an example of growth and development.
  - B. It shows man's adaptation to his environment.
  - C. It is the ability of the man to regulate his internal condition.
  - D. It ensures the survival of man and in carrying out his functions.
31. Which of the following descriptions about the organization of an ecosystem is correct?
- A. Communities make up species, which make up populations.
  - B. Populations make up species, which make up communities.
  - C. Species make up communities, which make up populations.
  - D. Species make up populations, which make up communities.
32. Which of the following is a correct pair of organ and organ system?
- A. lungs-excretory
  - B. brain-circulatory
  - C. mouth-respiratory
  - D. skin – integumentary
33. Which of the following terms refers to the biological process of producing offspring that are biologically or genetically similar to the parents?
- A. evolution
  - B. fertilization
  - C. development
  - D. reproduction

34. What term refers to the process of producing new organism by combining the genetic information of two individuals having different sexes?
- A. external fertilization
  - B. internal fertilization
  - C. sexual reproduction
  - D. asexual reproduction
35. Which of the following statements correctly differentiate sexual reproduction from asexual reproduction?
- A. Sexual reproduction is faster than asexual reproduction.
  - B. Sexual reproduction requires one parent while asexual requires two.
  - C. Sexual reproduction requires two parents while asexual requires one.
  - D. Sexual reproduction produces identical offspring while asexual produces offspring from two parents.
36. Which of the following is **NOT** correct about recombinant DNA technology?
- A. Plasmids and bacteriophages are examples of commonly used vectors.
  - B. Recombinant DNA (rDNA) technology helps produce better breeds of plants and animals.
  - C. The rDNA technology could also help in identifying criminals by studying a sample from a specific person.
  - D. The rDNA technology can be considered successful even if the foreign DNA inserted into the vector DNA is not expressing the desired trait in the host cells.
37. Which of the following crop is not genetically modified?
- A. Bt corn
  - B. golden rice
  - C. BT eggplant
  - D. conventional rice
38. Which of the following is considered a risk of GM food to people's health?
- A. GM food enhanced pathogenicity.
  - B. GM food production cost is reduced.
  - C. GM food increased weed or pest burden.
  - D. GM food contains higher amounts of vitamins and minerals.
39. What responses are generated by the nervous system when you run on a treadmill?
- A. Dispose waste from the body
  - B. Get the oxygen into our body and get rid of carbon dioxide.
  - C. Food is broken down by to give energy to every cell in the body.
  - D. Once exercise begins, the sympathetic nervous system is activated, and the heart rate rises quickly



40. Pablo went out with his friends almost every day to have fun and takes whatever vices they want. One day he complains abdominal pain and notices that the appearance of his skin turns yellowish which are some symptoms of a liver problem. Which do you think among his vices caused him liver problem?
- A. Smoking
  - B. Gambling
  - C. Social games
  - D. Alcohol Consumption
41. There is a couple who wish to have a child but cannot have it because the wife was diagnosed with Polycystic ovary syndrome (PCOS). It is a condition in which the ovaries produce an abnormal number of androgens, male sex hormones that are usually present in women in small amounts that cause infertility of women having it. However, it can be treated by maintaining healthy weight, conducting regular exercise and balance diet. Based on the given situation, is it possible for the couple to bear a child?
- A. Yes, PCOS will just go away on its own.
  - B. Yes if they will just follow the suggestions of their doctor.
  - C. No because there is no treatment for PCOS.
  - D. No because female ovaries with PCOS totally can't release egg cells.
42. When you're faced with a perceived threat, your brain thinks you're in danger. That's because it already considers the situation to be life threatening. As a result, your body automatically reacts to keep you safe. What hormone is responsible for this response?
- A. Adrenalin
  - B. Melatonin
  - C. Vasopressin
  - D. Growth Hormones
43. Pedro who met an accident dislocated his two long bones in his hand. What do you think is the cause of such dislocation?
- A. Tendon break
  - B. Ligament break
  - C. Areolar tissue break
  - D. Break of skeletal muscle
44. Covid 19 pandemic affects the immune system of individual who will be infected with this virus. As a student, which of the following campaign below is the best thing to promote to boost your immune system?
- A. Drink alcohol in moderation.
  - B. Always observe health protocols.
  - C. Have an exercise at least once a week.
  - D. Eat a diet high in fruits and vegetables.

45. Gregor Mendel was considered as the Father of Modern Genetics. Which of the following works was associated with him?
- Study with pea plants
  - Expedition in the Galapagos Islands
  - Discovering the molecular structure of DNA
  - Determination of the double-helix structure of DNA
46. For certain organisms to survive, they need to learn the process of adaptation by which a species becomes fitted to its environment. Which of the following situations exhibits adaptation?
- Birds with light bones of their wings for easy flying.
  - Giraffes having long necks for feeding in the top of trees
  - Animals staying in one place all the time to protect its home
  - Succulents which store water in their short, thick stems and leaves in preparation for dry season.
47. Based on the figure below, what is common among human arm, cat's leg, whale flipper and bat's wing?



*Figure 2. Bat wings, human forearms, whale and cat forelimbs*

(Source: <https://socratic.org/questions/bat-wings-human-forearms-elephant-legs-and-cat-forelimbs-are-what-type-of-struct>)

- Have the same bones.
  - Share common ancestors.
  - Body parts have the same functions.
- I only
  - II only
  - I & II only
  - II & III only

48. Someone gives you two black beetles: Carbonized Darkling Beetle (*Eleodes carbonaria*) and Armored Stink Beetle (*Eleodes armata*). What group they both belong in the biological classification of organisms?
- A. Family
  - B. Genus
  - C. Order
  - D. Species
49. On 16 December 2021, Typhoon Rai (local name Odette) brought torrential rains, violent winds, landslides, and storm surges in the provinces of Surigao del Norte and Dinagat Islands in Mindanao, in five provinces of Visayas, and in the island of Palawan in Luzon before it exited the Philippine area of responsibility on 17 December 2021. If a natural disaster like Typhoon Odette devastates an ecosystem, what will this do to the carrying capacity of the population of a species within that ecosystem?
- A. Increase it.
  - B. Decrease it
  - C. Always reduce it down to zero.
  - D. Will not affect it, so it will stay the same.
50. The family of Amelia lives in a “sitio” where most of her relatives are also living there because it’s where their farm located which is the source of their foods. Cora, friend of Amelia lives in another sitio, 5 kilometers away from Amelia’s place. The family of Cora is living in another sitio because it is where their farm located. How will you classify the household-population distribution pattern with Amelia’s & Cora’s place?
- A. Clumped Distribution
  - B. Random Distribution
  - C. Uniform Distribution
  - D. Vertical Distributions