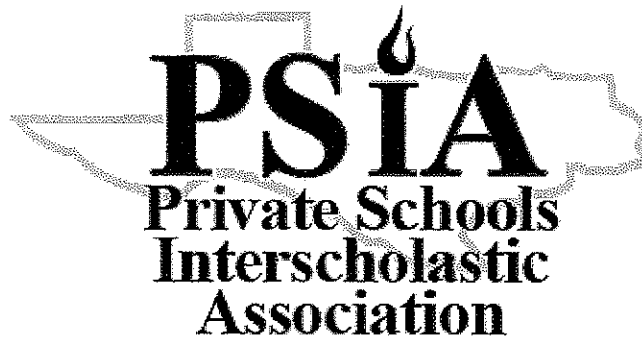


CONTESTANT ID #: _____

*Place Contestant ID label here BEFORE
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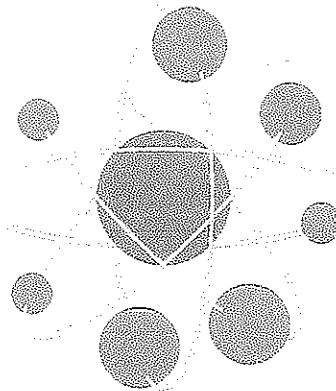
GRADE LEVEL : _____



Science

State Contest

Grades 6-8



2023

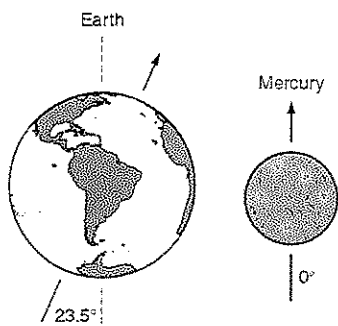
FINAL SCORE: _____

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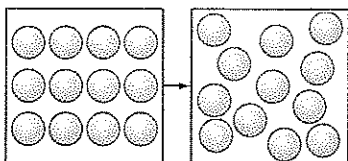
2023 PSIA State Science Contest – Grades 6-8

- (1) What is the process in which rainwater carries dissolved minerals deeper into the ground?
A) carbonation D) oxidation
B) slagging E) exfoliation
C) leaching
- (2) Cool air masses tend to
A) mix easily with warm air masses.
B) be lifted by denser warm air masses.
C) be denser and flow under warm air masses.
D) be less dense and flow over warm air masses.
E) be less dense and flow under warm air masses.
- (3) When a red blood cell is in a salty solution, it loses water due to
A) active transport. D) exocytosis.
B) osmosis. E) endocytosis.
C) vesicle movement.
- (4) What is the momentum of a 12-Kg rock moving with a speed of 6 m/s?
A) 72 Kg-m/s D) 36 Kg-m/s
B) 432 Kg-m/s E) 18 Kg-m/s
C) 216 Kg-m/s
- (5) At 12 noon in Austin, what time is it in El Paso?
A) 1:00 PM D) 12:00 PM
B) 11:00 AM E) 1:00 AM
C) 12:00 AM
- (6) $450 \text{ cm}^2 = \underline{\hspace{2cm}} \text{ mm}^2$
A) 4.50 D) 4500
B) 0.450 E) 45000
C) 0.0450
- (7) Where does photosynthesis take place?
A) chlorophyll D) chloroplasts
B) carbohydrates E) chromatids
C) pistil
- (8) Soil containing decayed plant and animal material is called
A) humus. D) subsoil.
B) chorizo. E) permafrost.
C) sediment.
- (9) Which of the following is an example of a diatomic element?
A) O₂ D) Mg
B) H₂O E) NaCl
C) CaCl₂
- (10) Which of the following would weigh the least?
A) 1 cm³ of gold D) 1 cm³ of air
B) 1 cm³ of water E) All weigh the same
C) 1 cm³ of glass
- (11) As rocks move farther away from mid-ocean ridges, they lose thermal energy and become more dense, causing
A) uplift. D) tsunamis.
B) subsidence. E) sea-floor spreading.
C) subduction.
- (12) A sound wave would take the least time to travel through
A) steel. D) vacuum.
B) water. E) air.
C) rubber.
- (13) If the food you eat contains bacteria, your stomach will most likely
A) pass it on to the intestines.
B) pass it on through the anus.
C) revolt, causing you to vomit.
D) destroy it during chemical digestion.
E) destroy it during mechanical digestion.
- (14) Scientists are developing new varieties of catfish that grow much faster than wild catfish. Some people are concerned about how these new catfish will affect the environment. Which of the following describes an environmental concern about this fast-growing catfish?
A) Only wild catfish will be eaten.
B) The fast-growing catfish will compete with wild catfish for food.
C) People will eat more of the fast-growing catfish than other types of fish.
D) The fast-growing catfish will cause the wild catfish it encounters to grow faster.
E) Predators will eat the fast-growing catfish and the wild catfish.

- (15) The diagram shows Earth and Mercury. What would be **most** affected on Earth if the angle of its axis were closer to that of Mercury?

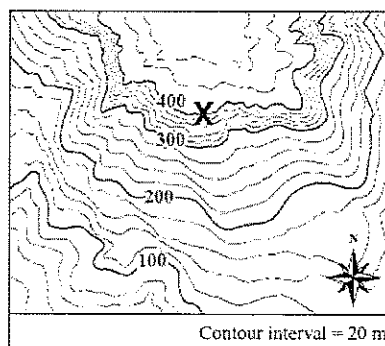


- A) stronger earthquakes
 B) solar eclipses and tides
 C) lunar eclipses and solar flares
 D) the seasons and the number of daylight hours
 E) the length of the year and the phases of the Moon
- (16) The diagram below shows a change in the arrangement of atoms within a substance. What type of change is **most likely** shown in this diagram?



- A) a phase change from gas to solid
 B) a phase change from gas to liquid
 C) a phase change from solid to liquid
 D) a chemical change in which a metal rusts
 E) a physical change in which a solute dissolves in a solvent
- (17) According to fossil evidence, different giraffes once had different neck lengths. All giraffes now have long necks. Which statement below explains this?
- A) Giraffes with long necks look smarter.
 B) Giraffes with short necks moved to another ecosystem.
 C) Giraffes with short necks became a different species.
 D) Giraffes with long necks had behaviors that stretched their necks.
 E) Giraffes with long necks were better able to reach food and produce more offspring.

- (18) The **X** on the map below shows the location of a physical feature. Which of the following is most likely marked by the **X** on the map?

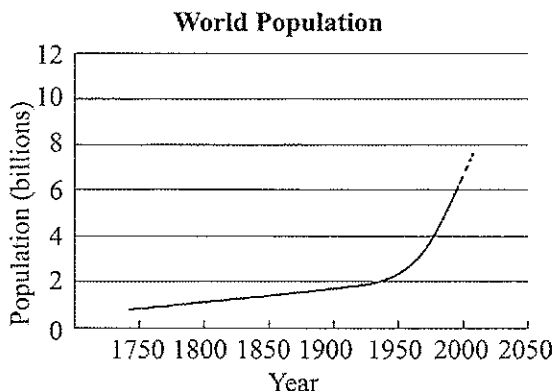


- A) a plain
 B) a river
 C) a lake
 D) a valley
 E) a cliff
- (19) In a marine ecosystem, algae are the primary producers in the environment. These organisms are also known as
- A) decomposers.
 B) omnivores.
 C) heterotrophs.
 D) autotrophs.
 E) herbivores.
- (20) Which human body system attacks viruses and bacteria once they have invaded the body?
- A) immune
 B) endocrine
 C) circulatory
 D) muscular
 E) digestive
- (21) By the end of 2022 the Space Exploration Technologies company had placed over 1,000 satellites in low to medium earth orbit for what majority use?
- A) internet connection
 B) amateur ham radio use
 C) earth weather observation
 D) military observational use
 E) cosmic rays and exoplanet observations
- (22) How has genetic engineering helped farming?
- A) by developing better fertilizer for crops
 B) by producing faster ways to harvest crops
 C) by creating crops that resist some diseases
 D) by producing soil that makes crops grow better
 E) by helping farmers read soil reports better

- (23) A student is investigating the temperature at which evaporation takes place. Which statement **best** shows that evaporation has taken place?
- A) Rain falls from the sky.
 - B) The sky is clear of clouds.
 - C) Water droplets fall from the roof.
 - D) Water droplets appear on the grass.
 - E) Water droplets disappear from the grass.

- (24) Which are **most** responsible for creating acid rain pollution?
- A) electric car batteries
 - B) nuclear power plants
 - C) hydroelectric power plants
 - D) wood-burning power plants
 - E) coal-burning power plants

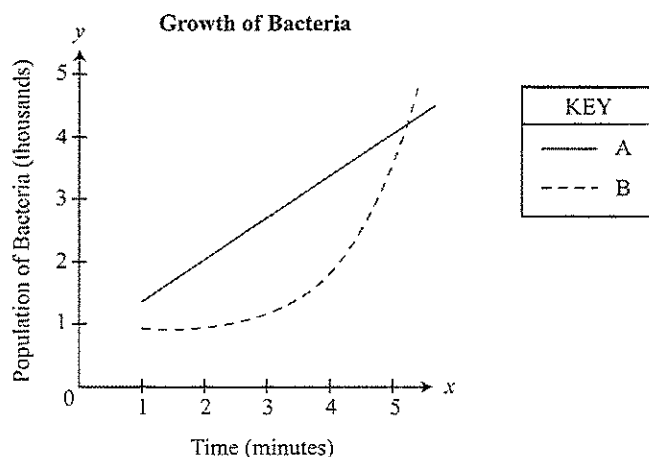
- (25) The graph below shows a population trend of Earth. What will most likely be the population of Earth in the year 2050?



- A) 6 billion
- B) 9 billion
- C) 12 billion
- D) 50 billion
- E) 100 billion

- (26) When performing an experiment for a science fair, what should be done if the data do **not** support the hypothesis?
- A) Check for errors and run the experiment again.
 - B) Change the conclusion to match the hypothesis.
 - C) Change the hypothesis to match the conclusion.
 - D) Change the variable so the data will match the hypothesis.
 - E) Ignore the data and prepare the science fair display anyway.

- (27) The graph below shows the amount of bacteria present during an experiment. What can be concluded from this experiment?



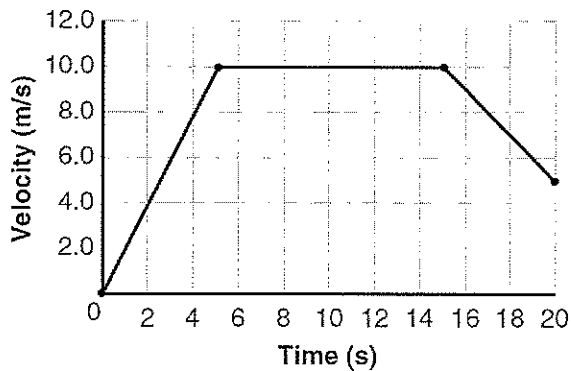
- A) At the beginning of the experiment, there are more B bacteria than A bacteria.
- B) At the beginning of the experiment, B bacteria increased faster than A bacteria.
- C) At the conclusion of the experiment, there are more A bacteria than B bacteria.
- D) At the conclusion of the experiment, B bacteria increased faster than A bacteria.
- E) The growth rate of the number of B bacteria is constant over the experiment time.

- (28) Which sentence describes a characteristic of offspring produced by sexual reproduction?
- A) The male offspring contain only genes from the father.
 - B) The female offspring contain only genes from the mother.
 - C) The offspring contain genetic material from both parents.
 - D) The offspring have half the amount of genetic material as the parents.
 - E) The offspring type of genetic material depends on the relative size of the parents.

- (29) Mackenzie pushed Wesley with a net force of 120 Newtons and Wesley moved 4 meters across their living room floor. How much work did Mackenzie perform on Wesley?
- A) 30 Joules
 - B) 60 Joules
 - C) 240 Joules
 - D) 480 Joules
 - E) 1,920 Joules

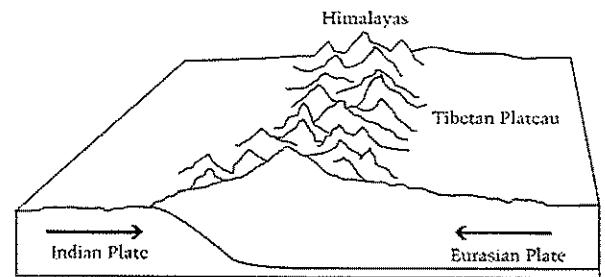
- (30) The offspring of a male lion and a female tiger is a liger. They are usually born in zoos because lions and tigers live in different habitats when they are in the wild. Ligers are much larger than either of their parents and cannot reproduce. Which evidence can be used to determine whether lions and tigers are the same species or different species?
- Lions and tigers are different species because ligers cannot produce offspring.
 - Lions and tigers are the same species because they can produce liger offspring.
 - Lions and tigers are different species because they eat different foods.
 - Lions and tigers are different species because they live in different habitats in the wild.
 - Lions and tigers are the same species because ligers are much larger than lions or tigers.

- (31) The graph below shows the velocity of a car over time. What **most likely** happened between 15 and 20 seconds?



- The car continued at the same speed.
 - The car stopped and then coasted forward.
 - The engine applied increased force to the wheels.
 - The brakes applied increased force to the wheels.
 - The car reversed course and started moving backward.
- (32) A voltage of 24 volts across a circuit with 48Ω resistance produces how much current?
- 2.0 Amps
 - 0.5 Amp
 - 24 Amps
 - 72 Amps
 - 144 Amps

- (33) Food webs show the flow of energy through an ecosystem. Which question can be answered by using a food web?
- Which populations will become extinct?
 - Which organisms have the shortest life span?
 - Which organism eats in the healthiest manner?
 - Which organism requires the largest number of calories?
 - Which populations will be affected by a change in another population?
- (34) The diagram below shows the collision of two tectonic plates in Asia. What is a result of this collision?



- Volcanoes erupt periodically.
 - The Tibetan Plateau slowly sinks.
 - Glaciers on the Tibetan Plateau melt.
 - The Himalayas increase in height each year.
 - The Himalayas decrease in height each year.
- (35) Where is the Earth's magnetic field the strongest?
- at the equator
 - at the North pole
 - at the Earth's poles
 - near Austin, Texas
 - along the international dateline
- (36) Which United States state lies closest to the San Andreas Fault?
- New York
 - Minnesota
 - California
 - Florida
 - Iowa

- (37) A geologist identifies the identical index fossils in rock layers from two different areas. Which conclusion is **best** supported by this discovery?
- A) Neutron emissions from the fossil layers are identical.
 - B) The deposition rate of the two rock layers was identical.
 - C) The two rock layers were deposited at approximately the same time.
 - D) The fossil organism evolved independently in the two separate areas.
 - E) The index fossil will also occur in sediment deposited on top of these rock layers.

- (38) Where is **most** of Earth’s freshwater located?
- A) the clouds
 - B) in ice caps
 - C) underground
 - D) the rivers
 - E) the reservoirs

- (39) A runner is preparing to run a long race. Which would provide the highest level of energy for the runner?
- A) carbohydrates
 - B) minerals
 - C) vitamins
 - D) water
 - E) proteins

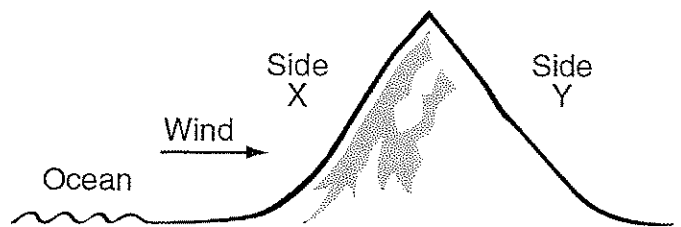
- (40) Which of the following sets of states are included as a part of “tornado alley”?
- A) Texas, Kansas, and Oklahoma
 - B) Oklahoma, Texas, and Virginia
 - C) Texas, Kansas, and New Mexico
 - D) Mississippi, Georgia, and Kansas
 - E) Texas, New Mexico, and Arizona

- (41) Which type of cell becomes cancerous in people who develop leukemia?
- A) red blood
 - B) epithelial
 - C) sperm
 - D) white blood
 - E) liver

- (42) Wesley, weight equals 140 Newtons, sits 1.5 meters from the fulcrum of a seesaw. To balance the seesaw, how far from the fulcrum must Noah, who weighs 120 Newtons, sit?
- A) 0.75 meter
 - B) 1.50 meters
 - C) 1.75 meters
 - D) 2.5 meters
 - E) 3.0 meters

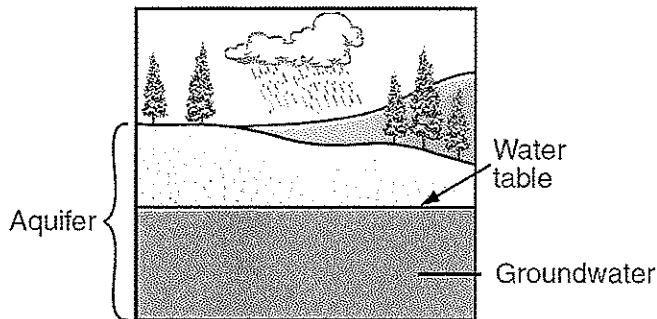
- (43) What is always the RNA start codon, where translation begins?
- A) ATG
 - B) DNA
 - C) GTA
 - D) AUG
 - E) ADZ
- (44) Fruit flies reproduce by sexual reproduction. What percent of genes does a fertilized egg of a fruit fly receive from one parent?
- A) 25%
 - B) 50%
 - C) 75%
 - D) 100%
 - E) 200%
- (45) Which group would be **most** negatively affected by the appearance of the wind turbines off the coast of Corpus Christi?
- A) people who construct wind turbines
 - B) people who like to visit Corpus Christi
 - C) Corpus Christi residents who live near wind turbines
 - D) Corpus Christi residents who want to prevent acid rain
 - E) Corpus Christi residents who want to hunt white tail deer

- (46) The diagram below shows wind approaching a mountain from an ocean. Which phrase describes the environment on Side Y of the mountain?



- A) very warm because the mountain absorbs the Sun’s heat
- B) very cold because the mountain absorbs the Sun’s heat
- C) very cold because the mountain has a high altitude
- D) very dry because moisture is lost when rain falls on Side X
- E) very wet because clouds form on Side X and move to Side Y

- (47) Grasses, shrubs, and trees are called producers because they make
- A) carbon dioxide.
 - B) minerals.
 - C) cereals.
 - D) water.
 - E) food.
- (48) The diagram below shows an aquifer. Which statement is **best** supported by the information shown in the diagram?



- A) The water table will rise if there is an increase in rain.
 - B) The water table will fall if the slope of the land changes.
 - C) The amount of groundwater in the aquifer will decrease if more trees grow.
 - D) The amount of groundwater in the aquifer will remain constant if there is a decrease in rain.
 - E) The amount of groundwater in the aquifer will remain constant if there is an increase in rain.
- (49) When do organs and organ systems begin to develop in humans?
- A) during childhood
 - B) before birth
 - C) during adulthood
 - D) before fertilization
 - E) during fertilization
- (50) Which human organ system eliminates liquid and gaseous wastes from the body?
- A) reproductive
 - B) circulatory
 - C) endocrine
 - D) integumentary
 - E) excretory



Science 6-8

State Contest

Contestant Answer Sheet

GRADERS: Write scores and initial.

Score 1: _____

Score 3: _____

Score 2: _____

FINAL: _____

Contestant ID: _____ Grade Level: _____

INSTRUCTIONS: Place the PRINTED CAPITAL letter of each answer choice (A, B, C, D, or E) in the blank corresponding to the test item number. SCORING: +5 for each correct answer; -2 for each incorrect answer; no deduction for skipped or unanswered items. Visible erasures and mark-outs constitute a 2-point deduction ONLY if a correct answer is not written in the answer space.

- | | | |
|-----------|-----------|-----------|
| 1. _____ | 18. _____ | 35. _____ |
| 2. _____ | 19. _____ | 36. _____ |
| 3. _____ | 20. _____ | 37. _____ |
| 4. _____ | 21. _____ | 38. _____ |
| 5. _____ | 22. _____ | 39. _____ |
| 6. _____ | 23. _____ | 40. _____ |
| 7. _____ | 24. _____ | 41. _____ |
| 8. _____ | 25. _____ | 42. _____ |
| 9. _____ | 26. _____ | 43. _____ |
| 10. _____ | 27. _____ | 44. _____ |
| 11. _____ | 28. _____ | 45. _____ |
| 12. _____ | 29. _____ | 46. _____ |
| 13. _____ | 30. _____ | 47. _____ |
| 14. _____ | 31. _____ | 48. _____ |
| 15. _____ | 32. _____ | 49. _____ |
| 16. _____ | 33. _____ | 50. _____ |
| 17. _____ | 34. _____ | |



Science 6-8

State 2023

ANSWER KEY

REMINDERS: PRINTED CAPITAL letters only. SCORING: +5 for each correct answer; -2 for each incorrect answer; no deduction for skipped or unanswered items. Visible erasures and mark-outs constitute a 2-point deduction ONLY if a correct answer is not written in the answer space.

- | | | |
|-------|-------|-------|
| 1. C | 18. E | 35. C |
| 2. C | 19. D | 36. C |
| 3. B | 20. A | 37. C |
| 4. A | 21. A | 38. B |
| 5. B | 22. C | 39. A |
| 6. E | 23. E | 40. A |
| 7. D | 24. E | 41. D |
| 8. A | 25. C | 42. C |
| 9. A | 26. A | 43. D |
| 10. D | 27. D | 44. B |
| 11. B | 28. C | 45. C |
| 12. A | 29. D | 46. D |
| 13. D | 30. A | 47. E |
| 14. B | 31. D | 48. A |
| 15. D | 32. B | 49. B |
| 16. C | 33. E | 50. E |
| 17. E | 34. D | |