

CONTESTANT NUMBER:

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Score Test Below:

_____ Initials _____

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Papers contending to place:

_____ Initials _____



**University Interscholastic League
A+ Science Contest • Answer Sheet**

Write your contestant number in the upper right corner and circle your grade level below.

Circle Grade Level:

6th grade

7th grade

8th grade

1. _____

18. _____

35. _____

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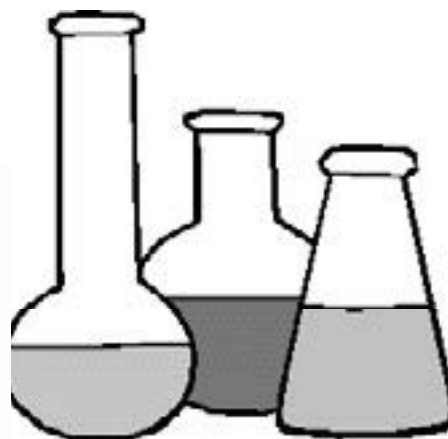
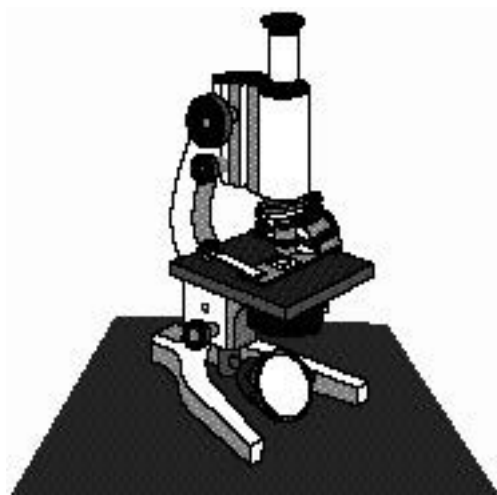
34. _____

INVITATIONAL 2022-2023

A+ ACADEMICS



University Interscholastic League



Science

**DO NOT OPEN TEST
UNTIL TOLD TO DO SO**

**UNIVERSITY INTERSCHOLASTIC LEAGUE
2022-2023 SCIENCE
INVITATIONAL TEST**

1. A student heats 50 mL of water and places it in a beaker. They then place a sugar cube in the heated water and records the temperature of the water every minute for ten minutes. In this experiment, what does the temperature represent?

A. Independent variable
B. Control
C. Dependent variable
D. Responsive variable

2. Based on the chemical equation, how many different elements and compounds are represented?



A. Elements – 3 Compounds – 2
B. Elements – 4 Compounds – 2
C. Elements – 2 Compounds – 3
D. Elements – 4 Compounds – 3

3. When a fruit is produced the energy located in the fruit is ___ energy until it is transformed during the process of digestion.

A. Kinetic
B. Electric
C. Chemical potential
D. Mechanical

4. Which of the following best explains why a hot dog is able to cook over a campfire when it is placed on a metal pole as shown?

A. Conduction
B. Convection
C. Radiation

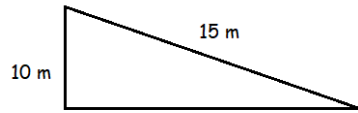


5. In which of tectonic plate would you find Rio de Janeiro, Brazil?

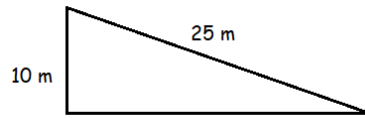
A. Pacific
B. Nazca
C. African
D. South American

6. Which of the following would require the least amount of force?

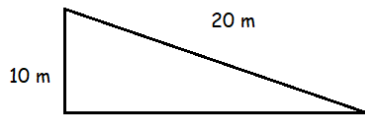
A.



C.



B.



D.

All are equivalent forces

7. The gravity on Mars is a little over one third of the gravity here on Earth. Of you could jump 3 meters on Earth, how far could you jump on Mars if you were to use the same amount of force?

A. 1 meter

C. 9 meters

B. 3 meters

D. 12 meters

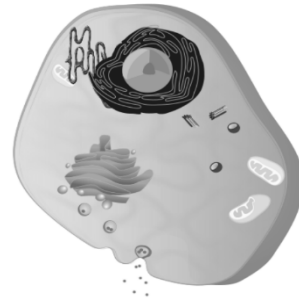
8. A student has mistakenly classified this organism as being prokaryotic. Which evidence best explains the error in classification?

A. The cell has a nucleus

B. The cell is from a plant

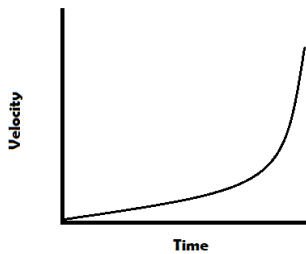
C. The cell lacks a nucleus

D. The cell is a bacteria

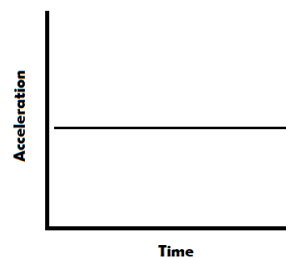


9. A train is moving at a constant velocity. Which graph best shows this?

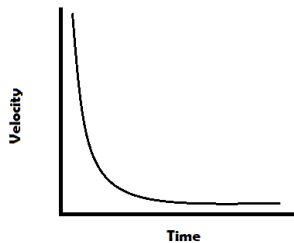
A.



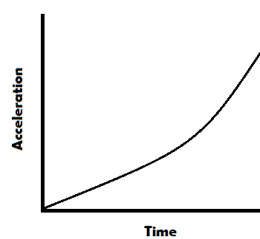
C.



B.



D.



10. Melting butter demonstrates which of the following?
 A. Physical change
 B. Chemical change
11. You find a ring with a mass of 107 g laying on the sidewalk. You fill a graduated cylinder up with 10 mL of water and put the ring into the cylinder. The water rises up to the 15 mL mark. Based on the table, what type of material is the ring made from?

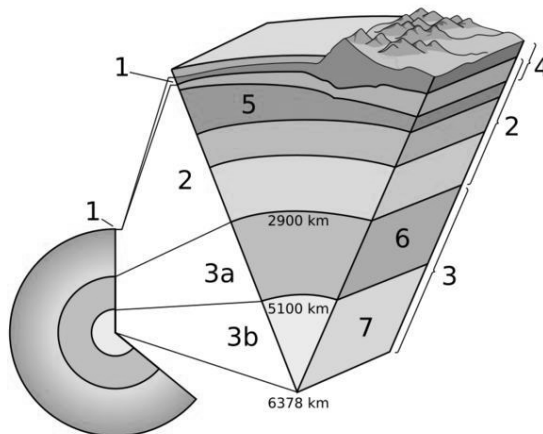
Density Table			
Material	Density (g/cm ³)	Material	Density (g/cm ³)
Copper	8.92	Gold	19.32
Platinum	21.4	Silver	10.49

- A. Copper
 B. Silver
 C. Gold
 D. Platinum
12. On a hot summer day, a child is selling lemonade. Which of the following items used in the lemonade would be the least dense?
 A. Cup
 B. Sugar
 C. Citric acid
 D. Ice
13. All of the following can be considered renewable except for –
 A. Hydroelectric dam
 B. Nuclear power plant
 C. Geothermal heating
 D. Windmills
14. Which of the following lists has only biotic factors?
 A. temperature, Daphnia, snail, guppy
 B. temperature, pH, conductivity, sunlight
 C. snail, guppy, Daphnia, algae
 D. snail, algae, guppy, sunlight

15. Which of the following will have a greater impact on kinetic energy of an object?
 A. Mass
 B. Velocity
 C. Gravitational force

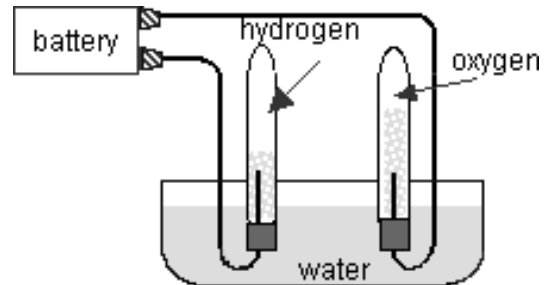
16. Looking at the model of the Earth, which structure is indicated at Position 4?

- A. Inner Core
 B. Outer Core
 C. Asthenosphere
 D. Lithosphere



17. Simple machines are useful when moving heavy objects because they-
- A. require less work
 - B. require less input force
 - C. do work for us
 - D. move things over shorter distances
18. Photosynthesis requires two raw materials. They are
- A. Chlorophyll and O_2
 - B. H_2O and sugar
 - C. H_2O and CO_2
 - D. O_2 and CO_2

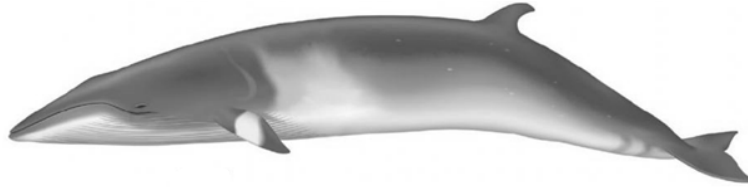
19. Based on the image, this best shows a –
- A. Chemical change
 - B. Physical change
 - C. Unbalanced reaction
 - D. Photosynthetic reaction



20. Mechanical or physical weathering is the process by which rock is broken down into smaller pieces by physical changes. Some ways that rock can be broken down physically include all of the following except:
- A. Temperature fluctuation
 - B. Abrasion
 - C. Oxidation
 - D. Plant growth
21. How can large volcanic eruptions and meteorite collisions have similar effects on Earth's climate?
- A. Both can cause the greenhouse effect to increase global warming
 - B. Both give off large forces that change the tilt of Earth's axis
 - C. Both cause acidic rain from the gases and particles they give off into Earth's troposphere
 - D. Both put huge volumes of dust and ash into the atmosphere, blocking the sun's energy
22. Earth supports life while the nearby Moon does not. All of the following are reasons why the Moon cannot support life compared to the Earth except:
- A. Abundance of water
 - B. Distance from Sun
 - C. Atmosphere
 - D. Lack of natural resources
23. An oak forest is an example of a climax community because of which of the following:
- A. The mature oak trees block sunlight below them, not allowing smaller trees and grasses to grow
 - B. The oak trees will grow and reproduce until they are disturbed or killed by man or nature
 - C. Oak trees are the largest vegetation that grows in the area
 - D. All of the above are true

24. Secondary succession will take place in each of these ecosystems except –
- A. An abandoned field
 - B. A shallow pool of water
 - C. A volcanic lava flow that forms a new island
 - D. A forest which has been clear-cut

25. Use the image and the Dichotomous key to correctly identify the whale shown.

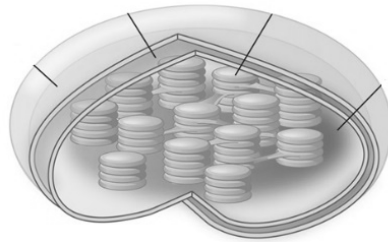


1a. Mouth with baleen (no teeth).....	6
1b. Mouth with teeth (no baleen).....	2
2a. Large melon (head)	Sperm Whale
2b. Small rounded head.....	3
3a. Distinct black and white markings on body	Orca
3b. Body mostly gray	4
4a. Has defined beak or “snout”	Bottlenose Dolphin
4b. No beak, rounded “snout”	6
5a. Specked markings on sides.....	Harbor Porpoise
5b. Body all gray, usually cover with scratches.....	Risso’s Dolphin
6a. Long pectoral fin/flippers with knobs on fins & head.....	Humpback Whale
6b. Shorter pectoral fin/flippers, smooth fins and head.....	7
7a. White band on pectoral fin/flipper	Minke Whale
7b. No white band on pectoral fin/flipper.....	8
8a. Body covered in barnacles, no dorsal fin, has dorsal knuckles	Gray Whale
8b. No barnacle growth on body, dorsal fin present.....	9
9a. Body solid blue color	Blue Whale
9b. Body with gray and white patterns	Fin Whale

- A. Orca
- B. Gray Whale
- C. Fin Whale
- D. Minke Whale

26. Which of these is a reaction to an internal stimulus?
- A. A runny nose when breathing dusty air
 - B. Itchy red skin when exposed to poison ivy
 - C. Your eyes become red and itchy when you are exhausted
 - D. Blisters on skin when sunburned

27. A designer who is building a new nose cone for rockets would choose materials with all these properties except
- A. Low density
 - B. High heat conductivity
 - C. Malleability
 - D. High melting point
28. Which of the following illustrates the hierarchy of cellular organization?
- A. cell, population, organ system, cell, community
 - B. molecule, cell, organ, organ system, organism
 - C. organism, organ system, population, organ, community
 - D. molecule, organ, organ system, organism, population



29. The structure seen is responsible for which of the following functions in a cell?
- A. Captures sunlight used in photosynthesis
 - B. Powerhouse of the cell
 - C. Directs cellular activities
 - D. Synthesizes and stores materials
30. An individual left a plant outside for several days without tending to it in the summer. The person noticed that the plant was beginning to wilt. Wilting in plants is a result of which of the following?
- A. Decrease in H_2O
 - B. Lack of CO_2
 - C. Increase in radiant energy
 - D. Decrease in O_2
31. If a diploid cell of an organism contains 90 chromosomes. What would an egg or a sperm cell of this organism would be expected to have this number of chromosomes?
- A. 90
 - B. 180
 - C. 45
 - D. 23
32. A neutral atom contains 20 neutrons, 18 electrons as well as protons. What would be the atomic number of this particular atom?
- A. 18
 - B. 20
 - C. 28
 - D. 40

33. Which best describes the following scenario:
A drone taking off and heading south at 25 kilometers per hour
- A. An example of speed
 - B. An example of acceleration
 - C. An example of speed and acceleration
 - D. An example of velocity and acceleration

34. What do the elements shown to the right have in common?
- A. They are noble gases
 - B. They do not form compounds with any other elements
 - C. They react with water to form salts
 - D. They are silvery solids that react with non-metals

3	6,94*	Li
11	22,99	Na
19	39,10	K
37	85,47	Rb
55	132,9	Cs

35. Scientists can tell that the sun rotates on its axis by observing which of the following:
- A. How the sunspots moving across the sun's surface from East to West
 - B. Changing magnetic forces coming from the sun
 - C. Fluctuating amounts of solar winds due to solar flares
 - D. Time that the sun rises and sets on Earth
36. Spring Tide occurs when
- A. There is a full moon
 - B. The Sun, Moon, and Earth are all aligned
 - C. At the first quarter and third quarter moons
 - D. When the Sun and Earth are the at their perihelion
37. Oxygen has an atomic number of 16. How many more electrons will it take to fill the valence shell and make it stable?
- A. 1 B. 2 C. 3 D. 8
38. The Virgo Cluster, unlike most other galaxies in the universe, has been observed with a blue shift. What does this mean?
- A. Movement of the source toward the observer
 - B. Movement of the source away from the observer
 - C. The source is not moving

39. Which of the following stars would have the lowest surface temperature?
- A. A Red dwarf
 - B. A White star
 - C. A Red Giant
 - D. A Yellow Star
40. Redshift and blueshift are used by astronomers to work out how far an object is from Earth. The concept of redshift and blueshift is closely related to which of the following
- A. Big Bang Theory
 - B. Theory of Relativity
 - C. Doppler Effect
 - D. Coulomb's Law
41. Which of the following would most likely result from a collision between a continental lithospheric plate and an oceanic lithospheric plate?
- A. Volcanic island arc
 - B. Chain of coastal volcanic mountains
 - C. Mid-oceanic ridge
42. If an active cold front overtakes a warm front which of the following occurs:
- A. An occluded front forms
 - B. The fronts cancel each other out due to interference
 - C. Cloud formation increases
 - D. A stationary front forms
43. Another form of interdependence between organisms is called symbiosis. There are several types of symbiosis. The difference between each type is determined by how beneficial or harmful the relationship is to the organisms. When one organism benefits and the other one remains constant or neutral, this is called...
- A. Mutualism
 - B. Commensalism
 - C. Colonialism
 - D. Parasitism
44. Only ten percent of energy stored in an organism is passed on to the next higher trophic level. Of the remaining energy, some is used for life processes, and the rest is
- A. Used in reproduction
 - B. Stored in lipids
 - C. Stored in muscles
 - D. Eliminated as thermal energy
45. During the drought in Texas, numerous deer temporarily left their usual territory to drink from water troughs that were being filled by farmers and ranchers. This behavior was probably due to:
- A. The need to find different food sources
 - B. The change in an abiotic factor in its natural environment
 - C. The need to find a new habitat
 - D. The change in a biotic factor in its natural environment

46. An excess of hot water is released into a reservoir, which of the following is most likely to immediately occur?
- A. An increase in pollution in the bay
 - B. A decrease of pollution in the bay
 - C. A decrease in the dissolved oxygen level
 - D. An increase in carbon-based compounds
47. Suppose you were making a circle graph of the following information about a laboratory budget. They said that 5% of their budget goes to consumables, 10% goes into equipment, 80% of the monthly income goes to paying all debts, and the remaining 5% is used for miscellaneous expenses that arise. How large of a section, in degrees, would the debts take up?
- A. 360° B. 288° C. 36° D. 18°
48. A spilled liquid base can be best neutralized with:
- A. Sodium bicarbonate
 - B. Water
 - C. Hydrochloric acid
 - D. Sodium hydroxide
49. When a scientist compares two objects or events, what is he or she most likely looking for?
- A. How the data was collected
 - B. Causes and effects for the data
 - C. Similarities in the data
 - D. Errors in the data collection
50. Which of the following is most likely correct?
- A. You can accept or reject a hypothesis, but never prove it to be true
 - B. You can always prove a hypothesis to be true
 - C. You can always prove a hypothesis to be false
 - D. Accepting or rejecting a hypothesis is the same as proving whether or not the hypothesis is true

**UNIVERSITY INTERSCHOLASTIC LEAGUE
2022-2023 SCIENCE
INVITATIONAL TEST**

Answer Key

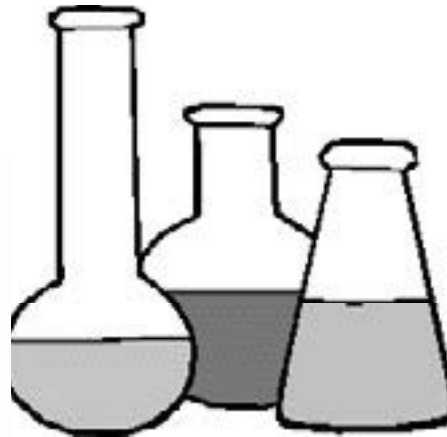
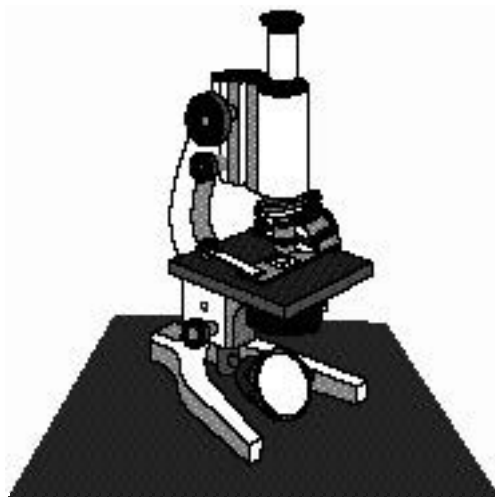
1. A	18. C	35. A
2. B	19. A	36. B
3. C	20. C	37. B
4. A	21. D	38. A
5. D	22. B	39. A
6. C	23. D	40. C
7. C	24. C	41. B
8. A	25. D	42. A
9. C	26. C	43. B
10. A	27. B	44. D
11. D	28. B	45. B
12. D	29. A	46. C
13. B	30. A	47. B
14. C	31. C	48. A
15. B	32. A	49. C
16. D	33. D	50. D
17. B	34. D	

FALL/WINTER DISTRICT 2022-2023

A+ ACADEMICS



University Interscholastic League

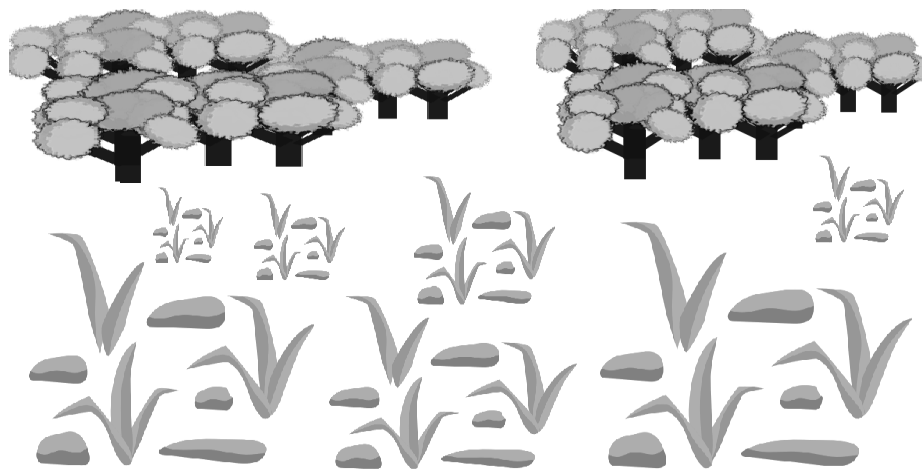


Science

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**UNIVERSITY INTERSCHOLASTIC LEAGUE
2022-2023 SCIENCE
FALL/WINTER DISTRICT TEST**

1.



Students are labeling the illustration with the most abundant elements. Which list of elements best labels the living matter represented in the illustration?

- A. O, S, H
- B. Na, H, O

- C. C, H, O
- D. Na, S, He

2. Which of the following is not a good characteristic to use to determine the type of mineral?

- A. Shape
- B. Color

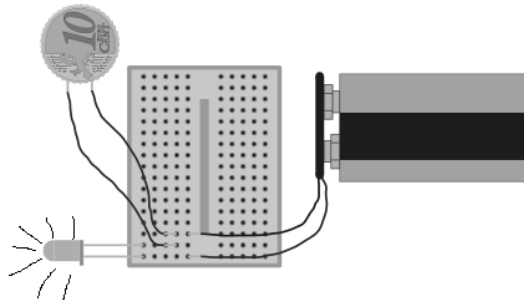
- C. Hardness
- D. Luster

3. What happens to the motion of gas molecules as the air temperature drops below zero degrees Celsius?

- A. Molecules move more randomly
- B. Molecular speed decreases
- C. Molecular speed increases
- D. Molecule remain constant

4. Due to increased temperature and pressure sedimentary rocks can transform into metamorphic rocks. What other type of rock transformation can have increased temperature and pressure also form?

- A. Igneous to metamorphic
- B. Sediment to sedimentary
- C. Metamorphic to sediment
- D. Igneous to sediment

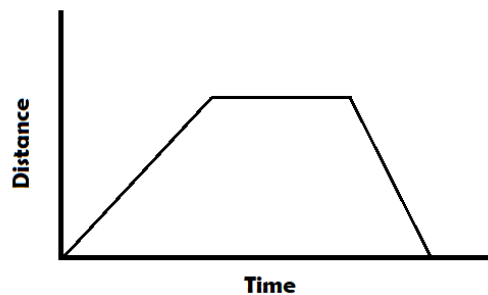


5. The light turned on when the item was placed in the circuit as shown. The item could not be classified as a –
 - A. Metal
 - B. Metalloid
 - C. Non metal
 - D. Semiconductor

6. An individual changes the color of the bottom of a swimming pool from beige to black because they heard it would increase the temperature of the water in the pool. The new color will help warm the pool water by transforming –
 - A. Nuclear energy from the sun
 - B. Chemical energy in the paint
 - C. Thermal energy from the paint
 - D. Radiant energy from the sun

7. A plant grown on Earth and on the ISS would most likely differ in which way?
 - A. Pigments of leaves
 - B. Shape of roots
 - C. Phototropism
 - D. Minerals needed

8. What type of motion would best describe the motion of the graph shown?
 - A. Launch of a rocket
 - B. Driving to school and back
 - C. Flight to Canada
 - D. Motion of clock hands

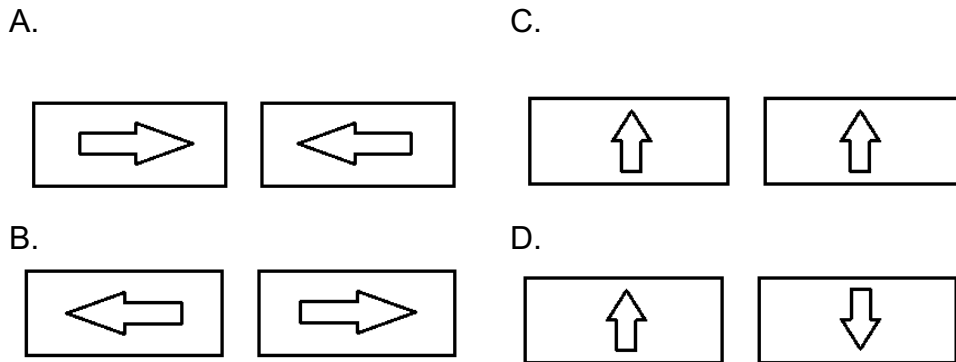


9. There are four ramps all at an incline of 25 degrees, the only different is the distance at which it takes to push the box up the ramp. Which of the following would require the least amount of force to lift a box?
 - A. Ramp of 10 meters
 - B. Ramp of 20 meters
 - C. Ramp of 25 meters
 - D. All the same

10. The following tables shows the development of space exploration in stages. Which item correctly completes the missing area?

First satellite launched into orbit
Animals sent into space
Humans walk on the moon
?

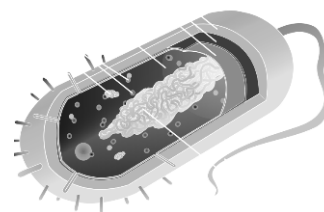
- A. Humans to outer space
 B. Explorer I launches
 C. ISS sent into orbit
 D. Pioneer I launched
11. Which shows the correct movement of the tectonic plates where the location of the Andes mountains formed?



12. Some plants use brightly colored flowers to attract pollinators. Which is the most likely conclusions about a plant that has small flowers that are hard to see?
- A. Doesn't produce a seed
 B. Wind pollination plant
 C. Ornamental plant
 D. Reproduce binary fission

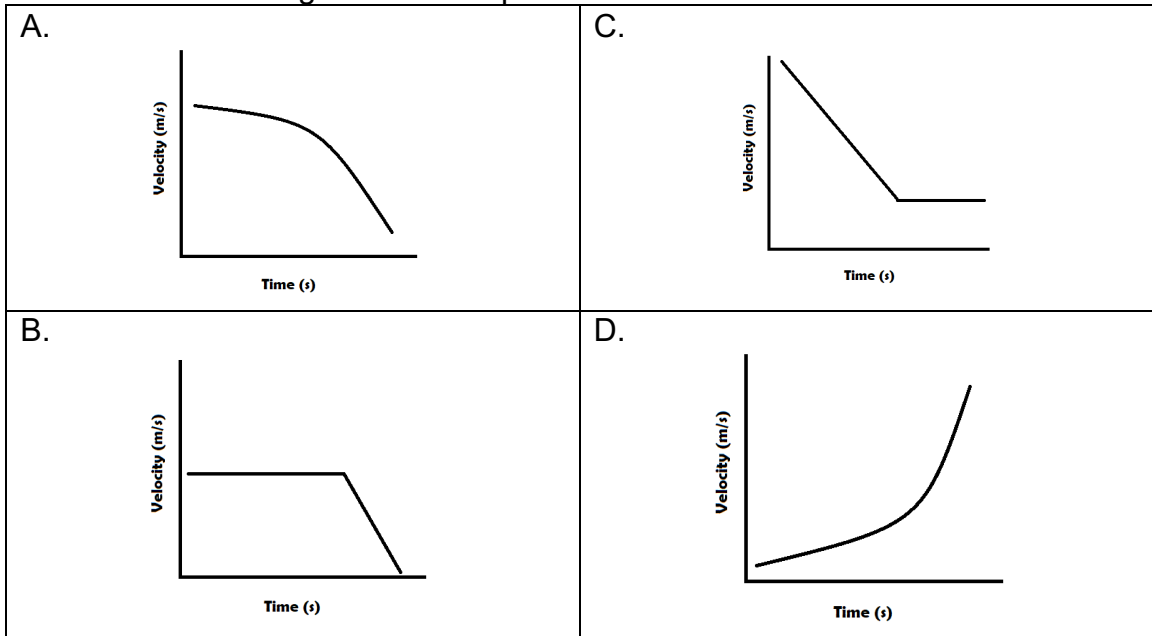
13. A student has classified this cell as being prokaryotic. What evidence is there to support this claim?

- A. Cell has a nucleus
 B. Cell is from an animal
 C. Cell lacks a nucleus
 D. Cell is from a plant

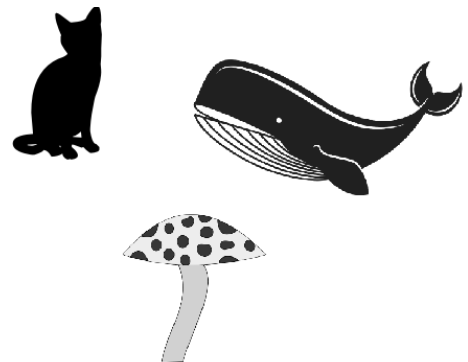


14. Which Texas region would most be affected by wind erosion?
- A. Panhandle
 - B. Pineywoods
 - C. Hill Country
 - D. All areas are the same
15. The instructions for a lab warned to avoid putting K in the liquid used in the lab. What element should not be placed in the liquid?
- A. Nitrogen
 - B. Carbon
 - C. Potassium
 - D. Krypton

16. Which of the following would show positive acceleration?



17. What do the three organisms have in common?
- A. All autotrophic
 - B. Composed of cells
 - C. All are omnivores
 - D. Are mammals

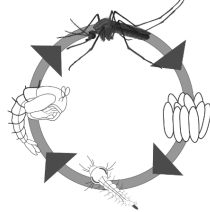


18. According to the US EPA, too much ground water discharge to streams can lead to erosion and alter the balance of aquatic plants and animals. Which human activity does this likely refer to?

- A. Hurricane
- B. Pumping water into the ground for gas extraction
- C. Overfishing
- D. Deforestation

19. Which image best shows an ecosystem?

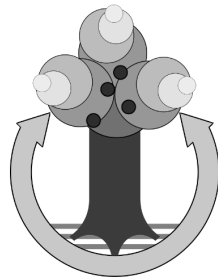
A.



C.



B.



D.



20. As the sun begins to die, in roughly 5 billion years, it will expand. Why will the Earth no longer be in the habitable zone?

- A. Gravity will increase
- B. Tides will increase
- C. Earth will become too hot
- D. Gravity will cause the asteroid belt to move into a closer orbit

21. Which environment would experience the greatest change in total number and type of species over time?

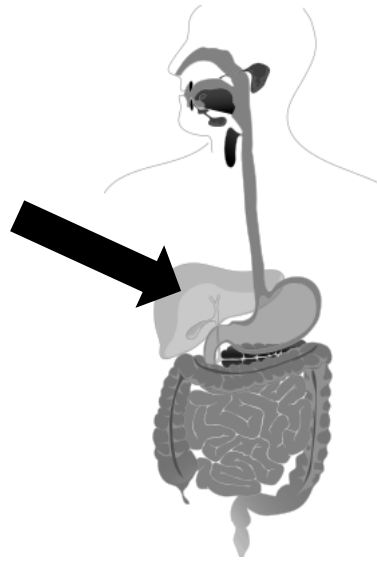
- A. Pioneer species
- B. Intermediate species
- C. Secondary succession
- D. Climax community

22. A swim bladder is an internal gas filled organ that contributes to the ability of many bony fish to do which of the following?

- A. Allows the fish to see deeper in the water
- B. Allows the fish to scare off predators by increasing in size
- C. Allows for extra storage of food
- D. Allow the fish to vary buoyancy in water

23. What is represented by the arrow in the diagram?

- A. Tissue
- B. Organ system
- C. Organ
- D. Cell



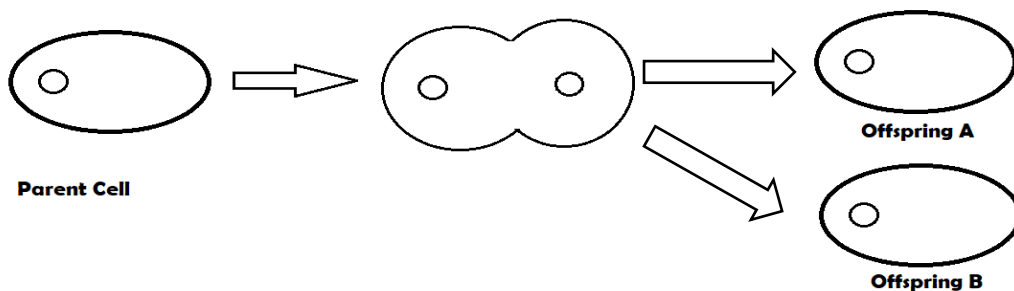
24. If a human notices a decrease in the production of urine, this could mean that the body could be having which of the following?

- A. Fever
- B. Dehydration
- C. Asthma
- D. Broken bone

25. A student is looking at a family photo album. The student notices that they look very similar to their great grandparents. What allows them to look similar to their relatives?

- A. Similar chromosomes
- B. Similar proteins
- C. Similar thylakoids
- D. Similar cell walls

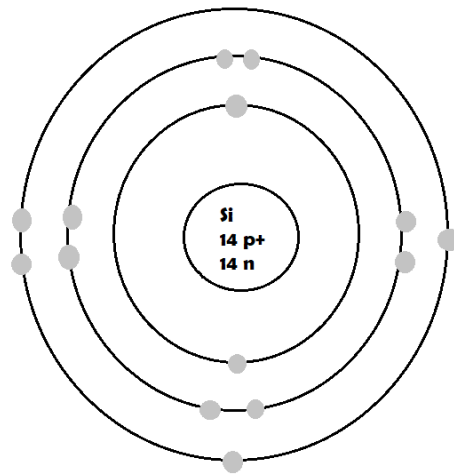
26. Based on the illustration. Which statement about the cells is correct?



- A. Bile destroys the genetic info in the parent cell which left the offspring viable
- B. Cells reproduce slowly due to acids within the organisms
- C. Cell A has different genetic information compared to Cell B
- D. Cell A has identical genetic information compared to Cell B

27. Which animal cell organelle is capable of reproducing independently within the cell?
- A. Cell wall
 B. Mitochondria
 C. Chloroplast
 D. Vacuole
28. A volleyball player notices that the harder the ball is hit, the more their hand hurts afterwards. Which law best explains this?
- A. Newton's 1st Law of motion
 B. Newton's 2nd Law of motion
 C. Newton's 3rd Law of motion
 D. Newton's 0th Law of motion
29. Students place a plant in a dark, windowless closet for two days. Which of these will help the plant maintain homeostasis?
- A. Growth of deeper roots
 B. Using stored sugars
 C. Decreasing diameter of the stem
 D. Going dormant

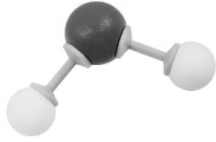
30. In the Bohr model of the atom shown, how many more electrons would it take to fill the valence shell and be stable
- A. 2
 B. 4
 C. 8
 D. 0



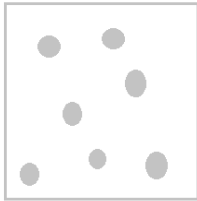
31. Students are given an activity which they are asked to classify the types of energy present in various physical situations found around their school. Which of the following best represents a conclusion that the students might write about in a lab report over the activity?
- A. All objects with kinetic energy can be found over 3 meters high.
 B. All objects with kinetic energy are cold.
 C. All objects with kinetic energy are macroscopic.
 D. All objects with kinetic energy must be in motion.

32. Which best illustrates a compound?

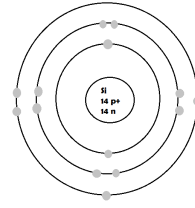
A.



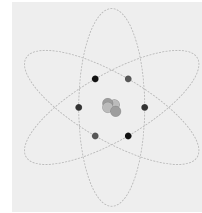
B.



C.



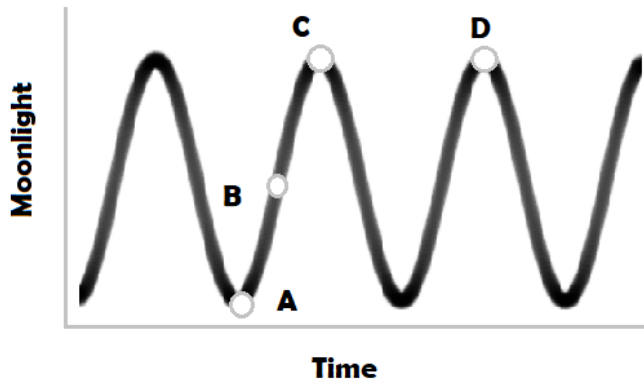
D.



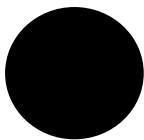
33. In an energy pyramid, at what level is the most usable energy available?

- A. Primary consumer
- B. Producer
- C. Secondary consumer
- D. Decomposer

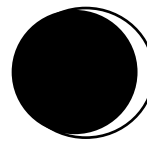
34. Based on the graph, what moon phase matches point B?



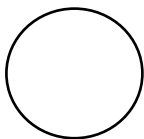
A.



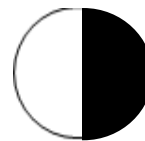
C.



B.



D.



35. Which star listed will have the largest numerical value for apparent magnitude?
- A. Our moon
 - B. White dwarf
 - C. Blue white super giant
 - D. Red giant
36. The very large array is a compilation of twenty-seven radio telescopes used to capture radio waves. The entire array is arranged with diameters of around 22 miles. Why are radio telescopes so large?
- A. Radio waves are very difficult to detect
 - B. Only certain stellar objects emit radio waves
 - C. So the radio waves can be controlled remotely
 - D. The wavelength of waves can be as long as mountain ranges
37. This individual helped strengthen the theory of plate tectonics. Before this person's explanations, most scientists believed that the continents did move but there were no good explanations. This person suggested the ocean floor moved and could push landmasses. The individual provided evidence using seafloor spreading to explain how continents move?
- A. Hess
 - B. Wegner
 - C. Hutton
 - D. Einstein
38. Ocean currents move warm and cold water throughout the oceans affecting weather and climate worldwide. Where do cold ocean currents originate from?
- A. Near the equator
 - B. Near the continents
 - C. Near the poles
 - D. In the middle of the oceans
39. A student is working with several chemicals in a lab. They wonder what would happen if they mixed the chemicals together. Which of the following should they not do?
- A. Wait for the teacher's instructions
 - B. Taste the chemicals before mixing them
 - C. Mix chemicals without instructions
 - D. Read the entire procedures for the lab before mixing any chemicals
40. A study of plant roots over time in an area showed that early plants had shallow root systems that stayed near the surface. Most recent plant life in the same area showed root systems that extend deep into the ground. Based on this information, plant species in this area lived changed from –
- A. Mountain region to hills
 - B. Forest to tundra
 - C. Grassland to desert
 - D. Desert to tundra

41. When commercial airplanes have to land or take off on short runways, it can be a rough flight. Why might passengers consider it unpleasant?
- A. The shorter the runways, the acceleration for takeoff or landing has to be greater.
 - B. The sight of a short runway can make people nervous.
 - C. The sight of the short runway can distract the pilots.
 - D. The runways are shorter, the velocity for takeoff or landing has to be lower.
42. This lab equipment is used to hold and heat small amounts of a liquid but doesn't have marked measurements. Which piece of equipment best identifies it?
- A. Graduated cylinder
 - B. Beaker
 - C. Pipette
 - D. Test tube
43. When someone talks about "how fast", what are they actually referring to?
- A. Time
 - B. Velocity
 - C. Speed
 - D. Acceleration
44. The heights of twins are measured yearly. What type of graph would be used to represent this?
- A. Line graph
 - B. Scatter plot
 - C. Bar graph
 - D. Circle graph
45. Which group readily donates electrons?
- A. Noble gases
 - B. Metals
 - C. Non-metals
 - D. Halogens
46. This is a comprehensive explanation of some aspect of nature that is supported by a vast body of evidence. Which of the following would not be an example of the previous description?
- A. The Big Bang
 - B. Plate Tectonics
 - C. Evolution by natural selection
 - D. Universal Gravitation
47. Elements in Group 18 are referred to as the noble gasses. What makes these elements unlikely to react?
- A. Number and placement of the electrons
 - B. Number of ions present
 - C. Number and placement of the neutrons
 - D. Number of protons

48. This individual developed a mathematical model for the structure of the nuclear shells of atoms. The theory of the structure of nuclear shells illustrated that protons and neutrons pair up with in the nucleus of the atom. What scientist does this most likely refer to?
- A. Yalow
 - B. Rutherford
 - C. Goeppert – Mayer
 - D. Thomson
49. Two theories for the origins of the universe were discussed in class. The Big Bang Theory as well as the Big Crunch Theory. One main difference between the two is that –
- A. The date on which the universe started
 - B. How the universe began
 - C. The purpose of the universe
 - D. How the universe changes
50. How are humans classified within a food web?
- A. Autotrophic
 - B. Consumers
 - C. Decomposers
 - D. Producers

**UNIVERSITY INTERSCHOLASTIC LEAGUE
2022-2023 SCIENCE
FALL/WINTER TEST**

Answer Key

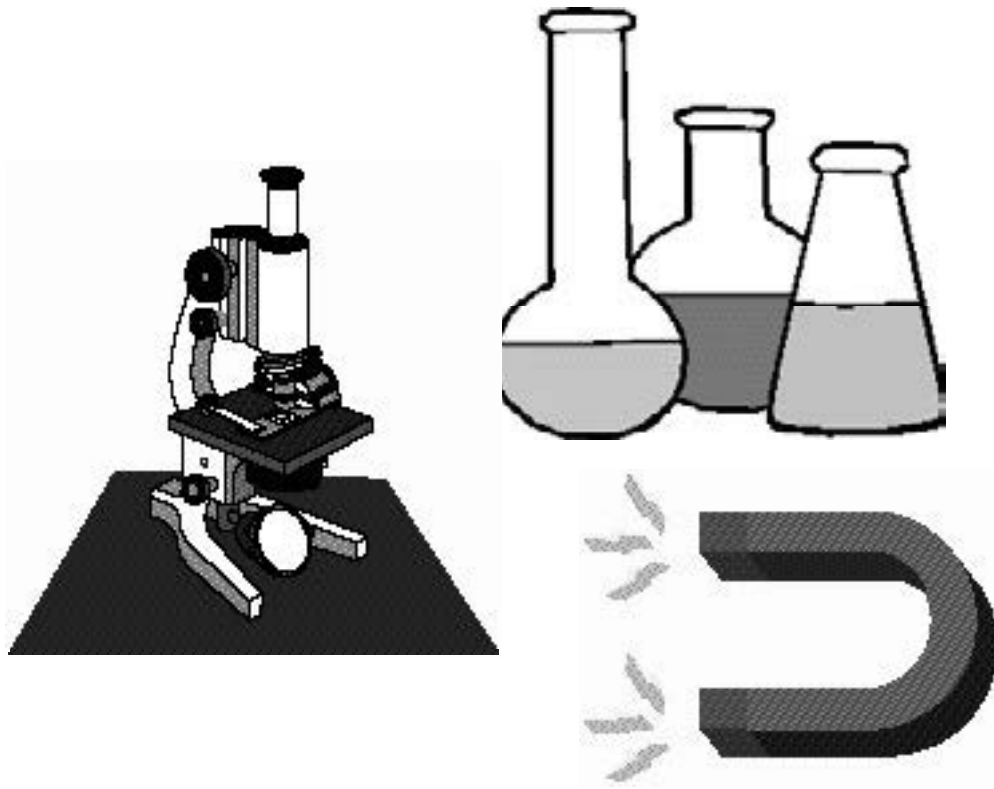
1. C	18. B	35. C
2. A	19. C	36. D
3. B	20. C	37. A
4. A	21. B	38. C
5. C	22. D	39. B
6. D	23. C	40. C
7. C	24. B	41. A
8. B	25. A	42. D
9. C	26. D	43. C
10. C	27. B	44. A
11. A	28. C	45. B
12. B	29. B	46. D
13. C	30. B	47. A
14. A	31. D	48. C
15. C	32. A	49. D
16. D	33. B	50. B
17. B	34. D	

SPRING DISTRICT 2022-2023

A+ ACADEMICS



University Interscholastic League



Science

**DO NOT OPEN TEST
UNTIL TOLD TO DO SO**

**UNIVERSITY INTERSCHOLASTIC LEAGUE
2022-2023 A+ SCIENCE
SPRING TEST**

1. Which of the following does not represent the meaning of an element?
- A. A stone made entirely of granite
 - B. A gum ball machine with different sized and colored gum balls
 - C. A package of shredded iceberg lettuce
 - D. A wall made of identical cinder blocks
2. Based on the chemical equation, how many different elements and compounds are represented?

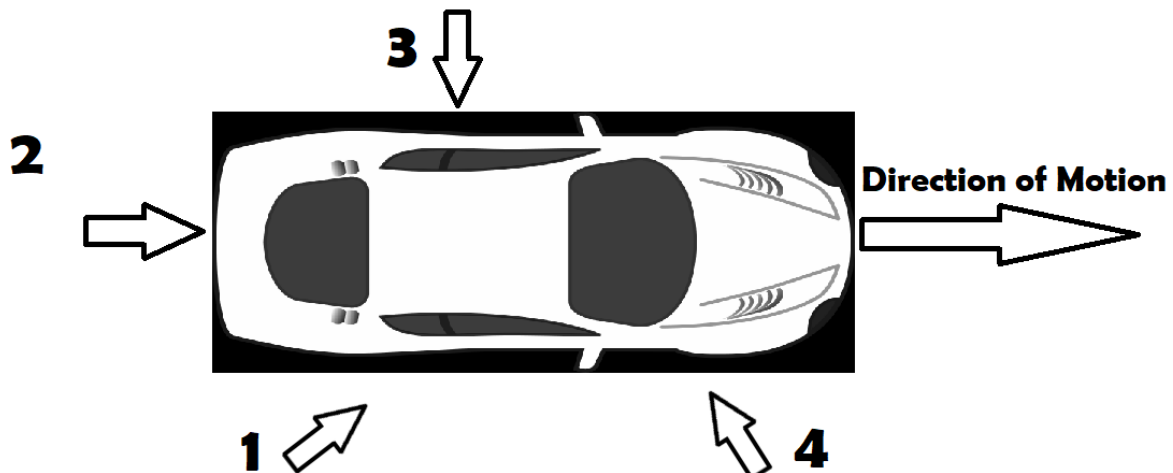


- A. Elements – 2; Compounds – 4
 - B. Elements – 4; Compounds – 3
 - C. Elements – 3; Compounds – 3
 - D. Elements – 2; Compounds – 2
3. What is an ecological model of the relationships that form a network of complex interactions among organisms in a community from producers to decomposers?
- A. Food web
 - B. Food chain
 - C. Ecosystem
 - D. Population
4. A neutral atom contains the following particles. What is its mass number?

Neutron	17
Electron	11
Proton	?

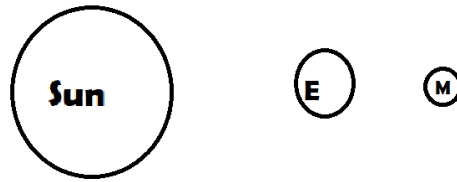
- A. 11 B. 17 C. 28 D. 45
5. Most scientists believe that atomic interactions depend primarily on the arrangement of valence electrons. This is most supported by observations of similar reactions of elements located –
- A. With similar number of protons
 - B. With similar mass numbers
 - C. In a period on the periodic table of elements
 - D. In a group on the periodic table of elements

6. A teacher puts two tablets into a liquid in a cup. The teacher stirs the liquid with the tablet submerged using a stirring rod and it begins to bubble. Which is less dense than the liquid in the cup?
- A. Tablet
B. Glass
C. Spoon
D. Bubbles
7. What property stays the same during both a physical and a chemical change?
- A. Density
B. Color
C. Mass
D. Particle arrangement
8. A car is moving down the street as shown. Which force will only affect the speed of the car?



- A. 1 B. 2 C. 3 D. 4
9. Which best describes the scenario below:
An airplane taking off traveling at 275 km/hr
- A. Example of speed
B. Example of velocity
C. Example of speed and acceleration
D. Example of velocity and acceleration
10. Which of the following describes a human activity that uses up non-renewable resources?
- A. Plowing topsoil and causing erosion
B. Cooking on a gas grill
C. Gathering fire wood for a camp fire
D. Electricity from a hydroelectric dam
11. This is the process of transforming chemical energy into forms of usable energy by the organisms?
- A. Photosynthesis
B. Homeostasis
C. Cellular respiration
D. Excretion

12. Using the diagram, what time would there be a high tide?



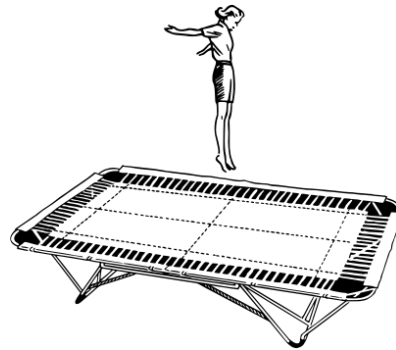
- A. 3 PM B. 6 PM C. 9 PM D. 12 PM

13. A marble, golf ball, and tennis ball all fall off a table towards the ground at the same time. The objects all hit the ground at the same time because each has the same –

- A. Acceleration
B. Inertia
C. Weight
D. Size

14. When the springs are compressed on the trampoline an increase of _ will occur.

- A. Chemical energy
B. Kinetic energy
C. Electrical energy
D. Potential energy



15. Which event would most likely have the effect of impacting the world's climate by lowering the temperatures as well as plant growth rate slows down?

- A. Hurricane C. Tornado
B. Large volcanic activity D. Large landslides

16. Main sequence stars like our sun tend to appear in the yellow range of visible light. Older stars generally tend to appear red. Blue stars are considered young stars and tend to burn –

- A. Very hot C. Similar temperature to our sun
B. Extremely cool D. Forever

17. Who proposed the closed universe theory?

- A. Einstein C. Copernicus
B. Friedman D. Ptolemy

18. Which of the following best explains why cold air displaces warm air?

- A. Convection
B. Conduction
C. Radiation

19. Students make a list of materials that are needed for humans to survive in space. Which item listed would account for the fact that space is a vacuum and can cause extreme temperatures?
- A. Solar panels
B. Electric heater
C. Rocket engines
D. Water
20. Some mountain ranges, such as the Alps, increase in elevation because of –
- A. Seafloor spreading
B. Earthquakes
C. Motion of the tectonic plates
D. Tsunamis
21. Oceanic and continental are two types of Earth’s –
- A. Core
B. Elements
C. Atmosphere
D. Crust
22. In which major tectonic plate would you find Paris, France?
- A. Pacific
B. Nazca
C. Eurasian
D. African
23. Students observe many different organisms living in a grassy field but they do not see any frogs. Which changes would most likely allow for frogs to live in this field?
- A. Landslide
B. Diversion of a stream to flow through the field
C. Grassfire
D. Increase in predators
24. On a hot summer day, a person steps onto asphalt from the grass while barefooted. Why does the asphalt seem so much warmer?
- A. Asphalt has a lower specific heat
B. Grass has a lower specific heat
C. Asphalt has a higher specific heat
D. Grass and asphalt have the same specific heat
25. A student made the following chart.

Group 1	Group 2
Mars	Neptune
Venus	Uranus
Mercury	Jupiter

- How did the student most likely use to separate the sets of planets?
- A. With and without satellites
B. With and without water
C. With and without atmospheres
D. Gas and terrestrial planets



26. The moon has about 1/6 the amount of gravitational force as Earth. If you can jump four meters on Earth, about how many meters can you jump on the moon using the same force?

- A. .24 m
- B. 2 m
- C. 24 m
- D. 12 m

27. Using the following information identify the insect.



1. Does the insect have wings? Remember most adult insects have 2 pairs of wings, but they're not always visible.	a. Yes	go to step 2
	b. No	Order Hemiptera
2. Does the insect have parallel wings?	a. Yes	go to step 3
	b. No	go to step 4
3. Does the insect have a parallel line down the back that divides the wings?	a. Yes	Order Coleoptera
	b. No	Order Orthoptera
4. Does the insect have 4 total wings?	a. Yes	go to step 5
	b. No	Order Diptera
5. Does the insect have long antennae?	a. Yes	go to step 6
	b. No	Order Odonata
6. Does the insect have a small body with large fan –shaped wings?	a. Yes	Order Lepidoptera
	b. No	Order Hymenoptera


- A. Order Hemiptera
- B. Order Hymenoptera

- C. Order Lepidoptera
- D. Order Orthoptera

28. Which relationship is most like a tick and dog?

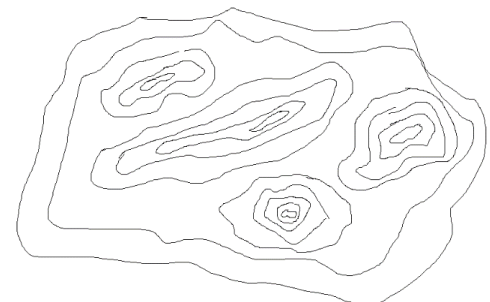
- A. *Ceratocystis fagacearum* & oak trees
- B. Hummingbird & flowers

- C. Fish & bear
- D. Goby fish & shrimp

29. Domains bacteria and eukarya are distinguished by:
- All bacteria are single celled and all eukarya are multicellular
 - Bacteria get nutrients from absorption and eukarya by photosynthesis
 - Only bacteria can grow and reproduce
 - Only eukarya have genetic material
30. Which pair best matches the pair of phrases below?
 children on a playground – park complex
- Population – ecosystem
 - Abiotic – biotic
 - Hypothesis – conclusion
 - Igneous – sedimentary
31. A class was studying human body systems. Students learned about a system that secretes hormones and regulates bodily processes. This is most likely the ____ system.
- Circulatory
 - Endocrine
 - Digestive
 - Excretory
32. Which of these can be found in a plant cell but not in an animal cell?
- Chromosome
 - Mitochondria
 - Ribosomes
 - Thylakoid
33. Two materials are mixed together in a plastic bag in the hopes of producing carbon dioxide. Which is the best evidence showing a chemical reaction has taken place to produce carbon dioxide?
- A color change
 - A precipitate is formed
 - Expansion of the sealed bag
 - An endothermic reaction occurred
34. A ball is tossed as shown.
- What force(s) cause this path?
- Inertia
 - Adhesion and cohesion
 - Forward speed and gravity
 - Spring forces
- 
35. Which of the following domains lack a nucleus but has a cell wall?
- Eukarya
 - Bacteria
 - Archaea
 - Bacteria and Archaea
36. In a plant, this describes growth in response to contact with another solid object.
- Hydrotropism
 - Thigmotropism
 - Phototropism
 - Heliotropism

37. Which of the following is not a result of heredity?
- A person only wearing designer clothes
 - A child that has blue eyes like his father
 - A child that has cystic fibrosis just like a grandparent
 - Triplets that all have red hair like their mother
38. Which system of the human body has a similar function to that of some cilia?
- Circulatory
 - Skeletal
 - Muscular
 - Endocrine
39. Using selective breeding, a new type of grain was produced for crop production in areas where the summer growing season is short. Which trait would be most useful for these farmers that will be planting this new grain?
- Extra-large seed size
 - Fast growing rate
 - Long stem length
 - Shallow root system
40. Which of the following is not considered a major benefit of recycling?
- Reducing consumption
 - Saves energy
 - Keeps materials out of landfills
41. Which would result in the most diverse offspring?
- A Self-pollinating flower
 - Butterflies pollinating from one flower to another
 - Planting cuttings from an African violet
 - Paramecia reproducing asexually
42. Which is not a reason why biodiversity is important?
- Biodiversity loss decreases the water quality
 - Species act as natural pest control
 - Too many species in an ecosystem
 - Promotes healthier maintained ecosystems
43. When it is summer in the Northern hemisphere, the Southern hemisphere would be experiencing?
- Winter
 - Spring
 - Summer
 - Fall
44. How many peaks are illustrated on this map?

- 1
- 2
- 3
- 4



45. Changes in the thickness of polar ice caps likely indicate changes in –
- Decreased solar flares
 - Earth's climate
 - Biodiversity of the artic
 - Increased fault activity
46. After a flood, scientists studying aquatic plants showed a decline in the rate of photosynthesis. Increases in the sediment lowers the amount of light in the water. Why would a decline in this rate lead to a decrease in the aquatic plant population?
- There is less water for absorption
 - There is less soil for nutrients
 - There is less radiant energy provided by the sun
 - There is less energy for reproduction
47. Which of the following is only part of a comparative investigation?
- Observations
 - Procedures
 - Variables
 - Data, graphs, and analysis
48. What is the length of the line above the ruler?



- 98 cm
 - 5.8 cm
 - 9.8 cm
 - 58 cm
49. Which of the following is not a scientific model?
- A computer program that shows the formation of mountain ranges
 - A computer program used to predict the weather
 - A dinosaur skeleton in a museum
 - A data table used to show information from a lab
50. This individual is credited with creating the Harvard Classification Scheme to classify stars based on their temperatures. This individual also catalogued 230,000 stars and discovered three hundred of these stars.
- Russell
 - Cannon
 - Hertzsprung
 - Galileo



**UIL A+ SCIENCE CONTEST
SPRING TEST
2022-2023
ANSWER KEY**

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