

CONTESTANT NUMBER:

FOR GRADER USE ONLY

Score Test Below:

_____ Initials _____

_____ Initials _____

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. _____

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. _____

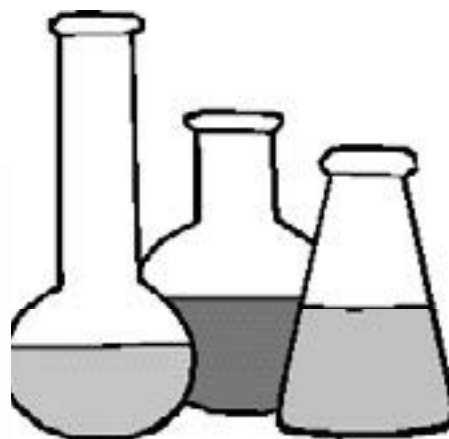
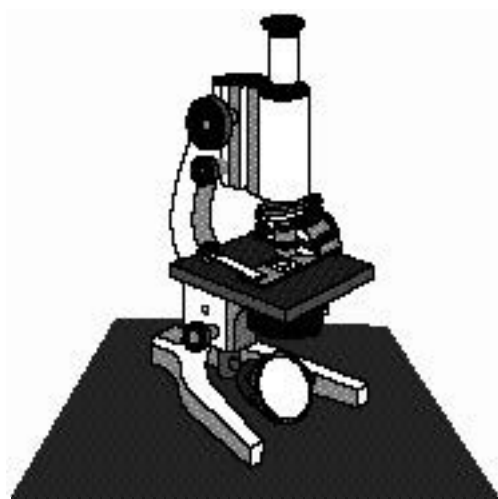
34. _____

INVITATIONAL 2021-2022

A+ ACADEMICS



University Interscholastic League



Science

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

UNIVERSITY INTERSCHOLASTIC LEAGUE 2021-2022 SCIENCE INVITATIONAL TEST

1. 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 Diptera
- D. Order Orthoptera

2. Aluminum oxide is considered which of the following?

- A. Element
- B. Mixture

- C. Isotope
- D. Compound

3. Which demonstrates a chemical change?

- A. Shattered mirror
- B. Melted copper
- C. A catalytic converter
- D. Mixing green solution and colorless solution to produce a green solution

4. Within any group of elements on the periodic table the metallic character tends to do which of the following from top down to bottom in the group?
 - A. Increase
 - B. Decrease
 - C. Remains constant
5. You think that you may have found a diamond while digging in your backyard. Its mass is 5.28 grams and the volume is 2 cm³. Using the density table provided, what material did you find?

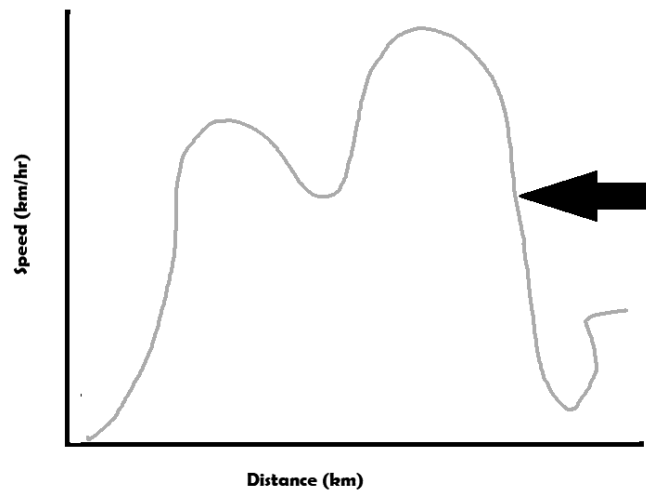
Material	Density (g/cm³)
Amethyst	2.66
Diamond	3.52
Quartz	2.64
Selenite	2.40

- A. Diamond
 - B. Quartz
 - C. Amethyst
 - D. Selenite
6. ___ uses thermal energy from inside the earth.
 - A. Nuclear Fission
 - B. Solar Energy
 - C. Biomass Energy
 - D. Geothermal Energy
7. Why do chefs often prefer pots that are good conductor of thermal energy when preparing meals?
 - A. They result in even heating and uneven cooking of food
 - B. They result in uneven heating and cooking
 - C. They result in even heating and cooking
 - D. They result in even heating and uneven cooking
8. Which of these statements does not illustrate the correct movement of thermal energy in nature?
 - A. In winter, closing a door to keep the cold air out
 - B. Ice melting in a glass of water
 - C. Cooking over a camp fire
 - D. Hot coffee sitting in an open coffee mug
9. What energy transformation is occurring in the image?



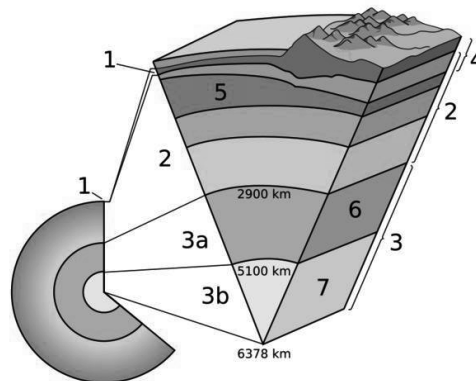
- A. Kinetic to gravitational
 - B. Gravitational to kinetic
 - C. Mechanical to thermal
 - D. Thermal to gravitational

10. Based on current positions of continents in what direction did South America move away from Pangaea?
 A. East
 B. West
 C. North
 D. South
11. In 2007, Voyager 2 crossed the boundary into the region at the edge of our solar system where solar winds run up against the gas between stars. This confirmed what about the shape of solar system?
 A. Squashed
 B. Rounded
 C. Donut
 D. Horseshoe
12. Which of the following was the first manned flight around the moon?
 A. Gemini 2
 B. Soyuz 12
 C. Apollo 8
 D. Apollo 11
13. Explain which of the following could occur at the segment specified on the graph?



- A. Accelerating
 B. Traveling downhill
 C. Starting cruise control
 D. Stopping at a red light

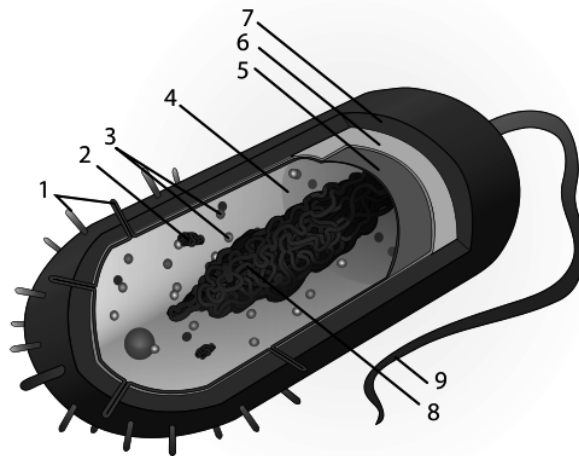
14. Looking at the model of the Earth, which structure is indicated at Position 5?



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

15. A butterfly is drinking nectar from a flower. Which item is considered abiotic in this environment?
- A. Air
B. Plane
C. Butterfly
D. Flower
16. The upward growth of plant shoots is an instance of negative tropism and the downward growth of roots is positive tropism. Which term best describes this statement?
- A. Gravitropism
B. Geotropism
C. Phototropism
D. Posttropism
17. What is transferred in a food chain?
- A. Energy Only
B. Matter Only
C. Energy and Matter
18. Animals ultimately get the chemical potential energy from which of the following sources?
- A. People
B. Plants
C. Other animals
D. Moon

19. Based on the cell shown, which of the following is true?



- A. The cell is a prokaryote
B. The cell is a virus
C. The cell is a eukaryote
D. The cell is multicellular
20. What type of change can be noticed in a burning candle?
- A. Physical change
B. Chemical change
C. Both physical and chemical

21. In 2013, the Brazos River had the highest water and sediment discharge of the rivers in the state of Texas, according to Joseph Carlin. Which factor best describes how this can occur?
- A. Weathering
B. Erosion
C. Deposition
D. Delta
22. What was the first organisms sent into space intentionally?
- A. Dog
B. Fruit fly
C. Squirrel monkey
D. Mouse
23. In an ecosystem, if the prey population increases drastically, which of the following may occur?
- A. Predator population will decrease
B. Autotroph population will increase
C. Predator population will increase
D. Prey population will decrease
24. Which of the following are least likely to be present during primary succession?
- A. Grass
B. Moss
C. Lichen
D. Trees
25. A plant that exhibits signs of wilting may have which of the following?
- A. Decrease in internal temperature
B. Increase in water
C. Decrease in water
26. A person cuts their finger with a pair of scissors. The individual then develops a bacterial infection in the cut. Which of the following would be true?
- A. The body will produce new white blood cells
B. The body will develop a fever
C. The person should get vaccinated
D. Both A and B
27. The adrenal glands release chemicals that control the kidneys and the blood sugar levels. Which body systems do the adrenal glands most effect?
- A. Circulatory & excretory systems
B. Digestive & immune systems
C. Circulator & integumentary systems
D. Digestive & nervous systems
28. Many organisms migrate to enhance their survival. Which mammal listed makes the longest migration?
- A. Artic tern
B. Humpback whale
C. Leatherback turtle
D. Monarch butterfly

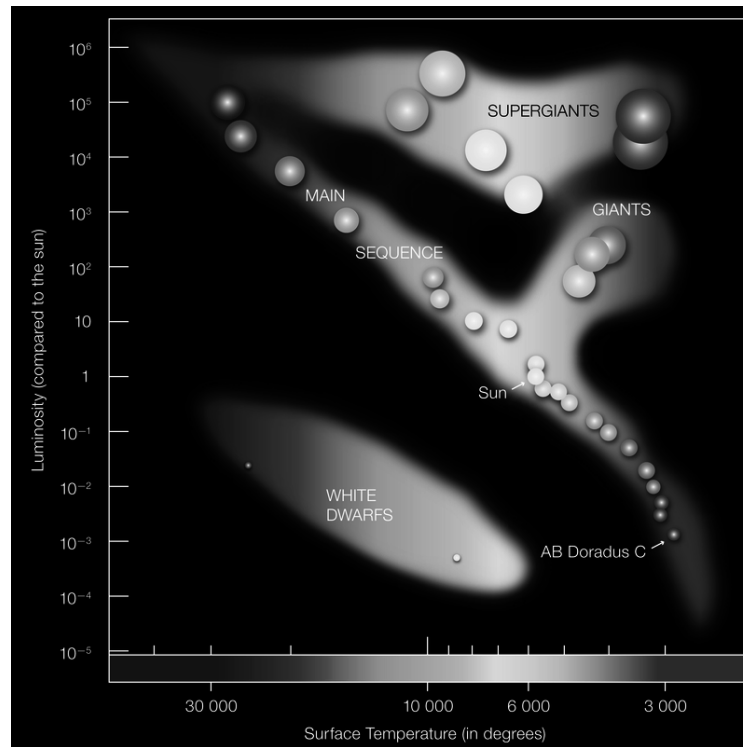


29. Which of the following environments would benefit a population of asexually reproducing organisms the most?
- An environment with rapid temperature fluctuations
 - An environment with very little change
 - An environment with a variety of climate changes
 - An environment that contains a large number of potential mates
30. Which one of the following traits cannot be inherited by an offspring?
- Cleft chin
 - Blue eyes
 - Curly hair
 - Scarred eyebrow
31. New street lights were installed near a park. The park goers notice several weeks later that some of the foliage near the new lights have changed shape. Which could account for this change observed?
- Geotropism
 - Phototropism
 - Thigmotropism
 - Hydrotropism
32. An atom has 10 protons. Which element would this be?
- Neon
 - Boron
 - Oxygen
 - Beryllium
33. A scientist needs an element that reacts like Arsenic but has a greater atomic mass. Which of the following elements should be used in this instance?
- Phosphorous
 - Bismuth
 - Nitrogen
 - Silicon
34. Three vehicles are traveling at the same speed but only one has a changing velocity. Which of the following helps explain why this can occur?
- One car accelerates faster than the others
 - One car is traveling in the opposite direction
 - One car is traveling along a curve in the road
 - One car needs a smaller force to move it
35. Which paper airplane has the greatest amount of force applied to it?

Airplane Prototype #	Mass (kg)	Acceleration (m/s ²)
1	.21	1.5
2	.11	3.2
3	.25	1.75
4	.19	2.5

- A. 1 B. 2 C. 3 D. 4

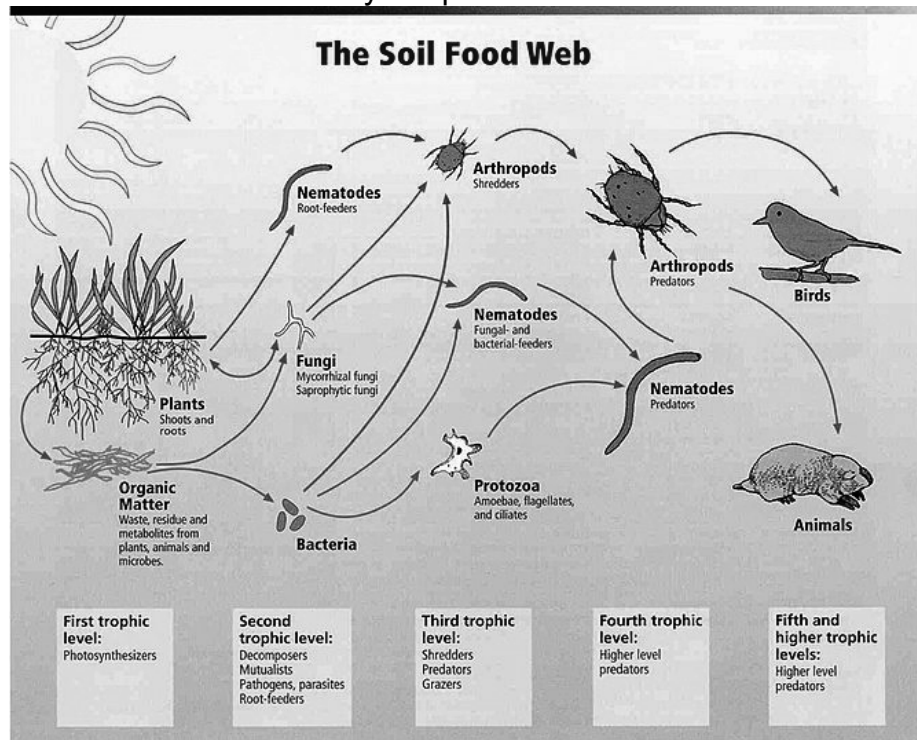
36. Which of the locations on Earth would experience the least fluctuation of daylight in a year?
- A. North pole
 B. South pole
 C. Equator
 D. Tropic of cancer
37. A person observes a new moon in the night sky. Which of the following phases will most likely occur after the new moon?
- A. Waxing gibbous
 B. Waxing crescent
 C. Waning gibbous
 D. Waning crescent
38. Which of these statements about the super giant Betelgeuse is most accurate?



European Southern Observatory (ESO)

- A. It is less bright than the sun and has a temperature below 3500 K
 B. It is less bright than the sun and has a temperature above 3500 K
 C. It is brighter than the sun and has a temperature below 3500 K
 D. It is brighter than the sun and has a temperature above 3500 K
39. Since the sun is the closest star to earth, which of the following statements is most accurate?
- A. It is hotter than many other stars
 B. It is denser than many other stars
 C. We do not consider it a star
 D. We obtain more energy from it
40. Convection currents do not occur in which of the following materials?
- A. Gas
 B. Liquid
 C. Solid
 D. None of these

41. This year they are predicting a more active hurricane season, which condition listed below is necessary for the formation of a hurricane?
- Warm ocean water
 - Strong cold front
 - Cool ocean water
 - Tropical winds
42. A crater that is located in a flat, arid environment will likely change in which of the following ways over time?
- Fill with rain water
 - Will collapse inside its self
 - Carter will become deeper
 - Erosion causes crater to become shallower
43. At this type of plate boundary, mountain ranges can form, volcanoes will form parallel to the boundary, and earthquakes are common. Which type of boundary does this best describe?
- Convergent
 - Subduction
 - Divergent
 - Transformative
44. How many organisms in this food web only eat producers?



Relationships between soil food web, plants, organic matter, and birds and mammals
 Image courtesy of USDA Natural Resources Conservation Service
http://soils.usda.gov/sqi/soil_quality/soil_biology/soil_food_web.html.

- 1
- 2
- 3
- 4

45. Bowhead whales feed almost exclusively on marine invertebrates such as krill and copepods. Since these whales eat these marine invertebrates they could most likely be classified as which of the following?
- A. Predator
 - B. Autotrophic
 - C. Parasitic
 - D. Host

46. Two balls have the masses shown:



Which situations would show work being done on these balls?

- A. Person holding both balls while seated
 - B. Holding the larger ball one meter above the ground
 - C. Standing still and holding the smaller ball
 - D. Lifting the small ball from the ground to the top of a table that is one meter high
47. One molar acid was spilled on that lab table. For safety, some baking soda was sprinkled over the spill. Which is the best evidence a chemical reaction has occurred?
- A. Formation of bubbles
 - B. Absorptions of liquid
 - C. Baking soda dissolves
 - D. Acid evaporates
48. In a lab, a student doesn't understand a part of the procedures written in the lab experiment. In this particular situation the student should:
- A. Proceed with the lab
 - B. Skip the step and do it later
 - C. Go to another group
 - D. Ask the instructor
49. When mixing acids and water together you should always do which of the following?
- A. Add water to acid
 - B. Combine acid and water at the same time
 - C. Add acid to water
 - D. Add a third solution to the mixture
50. Which of the following should not be disposed of properly in a special container?
- A. Broken test tube
 - B. Used battery
 - C. Used syringe
 - D. Vegetable oil

**UNIVERSITY INTERSCHOLASTIC LEAGUE
2021-2022 SCIENCE
INVITATIONAL TEST**

Answer Key

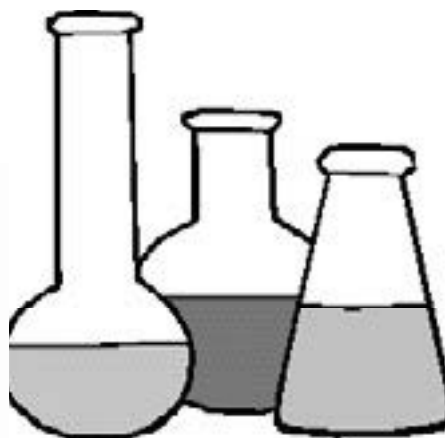
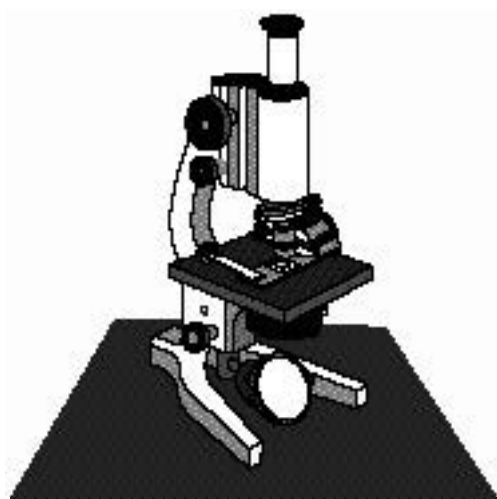
1. B	18. B	35. D
2. D	19. A	36. C
3. C	20. C	37. B
4. A	21. C	38. C
5. B	22. B	39. D
6. D	23. C	40. C
7. C	24. D	41. A
8. A	25. C	42. D
9. B	26. D	43. A
10. B	27. A	44. B
11. A	28. B	45. A
12. C	29. B	46. D
13. D	30. D	47. A
14. C	31. B	48. D
15. A	32. A	49. C
16. B	33. B	50. D
17. C	34. C	

FALL/WINTER DISTRICT 2021-2022

A+ ACADEMICS



University Interscholastic League



Science

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

**UNIVERSITY INTERSCHOLASTIC LEAGUE
2021-2022 SCIENCE
FALL/WINTER DISTRICT TEST**

1. Which substance in the equation for the reaction of methane is classified as an element?



- A. CH₄
B. O₂
C. CO₂
D. H₂O
2. Which familiar element makes up almost half of the mass of earth's crust?
A. H B. Si C. O₂ D. Fe
3. What is the density of a material that has a volume of 3.25 cm³ and a mass of 14.75 g?
A. .22 kg/cm³
B. 4.54 kg/cm³
C. 220.3 kg/cm³
D. .0045 kg/cm³
4. The advantage of this type of energy is that it can produce low cost energy, is reliable, and has zero carbon emissions. This best describes which of the following?
A. Wind energy C. Solar energy
B. Nuclear energy D. Geothermal energy
5. A tennis ball is dropped from a step stool one meter high. At which position does the tennis ball have the greatest kinetic energy and least potential energy?
A. At 1 meter high
B. At .5 meter high
C. At .25 meter high
D. At 0 meter high
6. A student makes a hot air balloon out of material they find at their house. What energy transformation occurs when a flame from a match lifts the balloon into the air?
A. Mechanical to chemical
B. Chemical to mechanical to thermal
C. Chemical to thermal to mechanical
D. Thermal to chemical to light

7. An unknown sample of an element is shiny and can be shaped when hammered. Which row of the table would correspond to properties of this element?

	Conductive	Melts Below 25° C
A	X	✓
B	X	X
C	✓	✓
D	✓	X

- A. A B. B C. C D. D

8. A cup of hot chocolate is placed on a table at room temperature and is left there for ten minutes. Which of the following best describes what will occur in this situation?
- A. The hot chocolate will remain the same temperature
 - B. The hot chocolate will gain heat from the environment
 - C. The hot chocolate will lose heat to the environment

9. This particular rock was found near the base of a volcano. After looking at this sample, which type of rock is it?



- A. Metamorphic B. Igneous C. Sedimentary

10. Which of the following is not a divergent plate boundary?

- A. Great Rift Valley in East Africa
- B. East Pacific Rise
- C. San Andreas Fault
- D. Mid-Atlantic Ridge

11. Per Newton's First Law of Motion, objects will continue to move in a straight line unless it is acted on by an unbalanced force. Which best explains the motion of a planet?

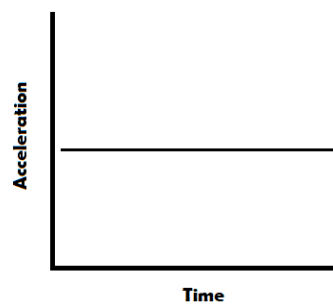
- A. There is no unbalanced force acting on the planet because space is a vacuum
- B. The gravitational force pulls the planet towards the sun at equal and opposite forces causing no unbalanced forces
- C. The sun moves in an elliptical orbit around the planet
- D. The planet moves in an elliptical orbit because of the gravitational force between the planet and the sun

12. A train is speeding up at a constant rate. Which graph best shows this?

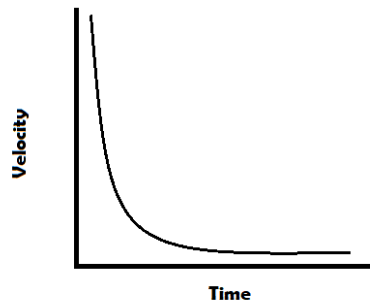
A.



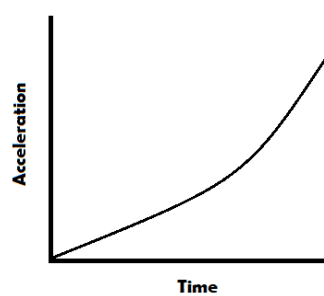
C.



B.



D.



13. Without the same amount of gravity as on Earth, what happens to the height of a person while in outer space?

A. Become taller

B. Become shorter

C. Remain the same

14. An organism has the following characteristics:

➤ Multicellular

➤ Autotrophic

➤ Has cell wall and nucleus

➤ Reproduces sexually or asexually

Which domain should this organism belong to?

A. Bacteria

B. Archaea

C. Prokaryota

D. Eukaryota

15. Photosynthesis is a ___ process.

A. Anabolic

B. Catabolic

C. Heterotrophic

D. Isotonic

16. All the interconnected feeding relationships in an ecosystem make up a:

A. Food interaction

B. Food chain

C. Food network

D. Food web

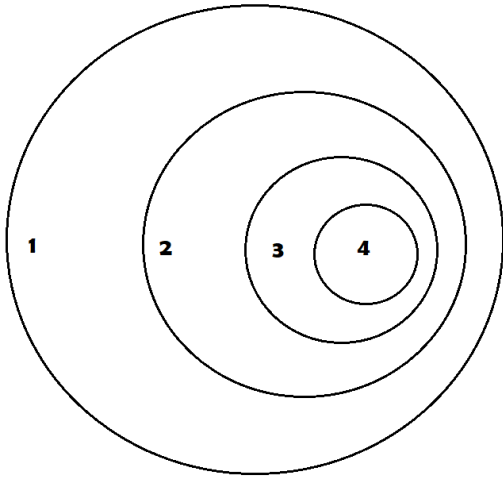
17. Gasoline is made up of organic compounds. What are the main elements in many organic compounds?

A. He, C, Na

B. Na, H, N

C. C, H, O

D. Ar, O, He



18. The graphic can be utilized to show the levels of organization within living organisms. If each circle is made from smaller circles inside it, what does circle one represent?

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

19. A paper sitting on a desk at rest has which of the following statements that best applies?

- A. There are no forces on the paper
- B. The paper pushes on the desk only
- C. The desk pushes on the paper only
- D. The forces acting on the paper are balanced

20. As an object is slid across the floor, what force must be overcome in order for the object to move?

- A. Support
- B. Friction
- C. Air resistance
- D. Gravity

21. Which event most likely causes an environmental disturbance in a grassland?

- A. Earthquake
- B. Volcanic eruption
- C. Hurricane
- D. Fire due to lightning strike

22. Most rabbits have a dark colored coat, but arctic hares have a white coat. How does this help it survive in its environment?

- A. It makes the hare warmer in summer
- B. It allows the hare to camouflage
- C. It appears smaller to predators
- D. It is able to absorb heat from the sun

23. Which situation will most likely result in an establishment of pioneer species in an ecosystem?

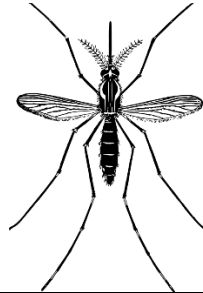
- A. Seasonal flooding in a wetland
- B. Harvesting a corn crop
- C. A fire caused by lightning in a grassland
- D. Cattle grazing in a field

24. How does secondary succession help restore equilibrium to an area destroyed by a natural disaster?

- A. Increases in number and types of species
- B. Species become extinct
- C. Stops further natural disasters from occurring
- D. Decreases the rate of natural selection

25. As our sun begins to die around 5 billion years from now, it will begin to expand. Why will the earth no longer be in the habitable zone of the sun?
- A. Water will become too dense
 - B. Tides will become extreme
 - C. It will become too hot to support life
 - D. Gravity will change the asteroid's orbital plane

26. 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

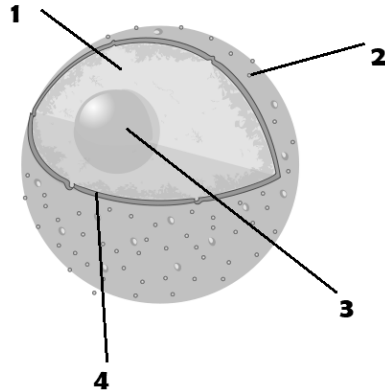
- A. Order Hemiptera
- B. Order Hymenoptera

- C. Order Orthoptera
- D. Order Diptera

27. Unlike animals that have circulatory systems, a plant does not. What have they developed instead to allow the plant to transport water and nutrients?
- A. Xylem
 - B. Chlorophyll
 - C. Thykolid
 - D. Nucleus

28. The excretory system in humans performs a function similar to that of what in a plant?
- A. Shoot system
 - B. Root system
 - C. Skeletal system
 - D. Vascular system

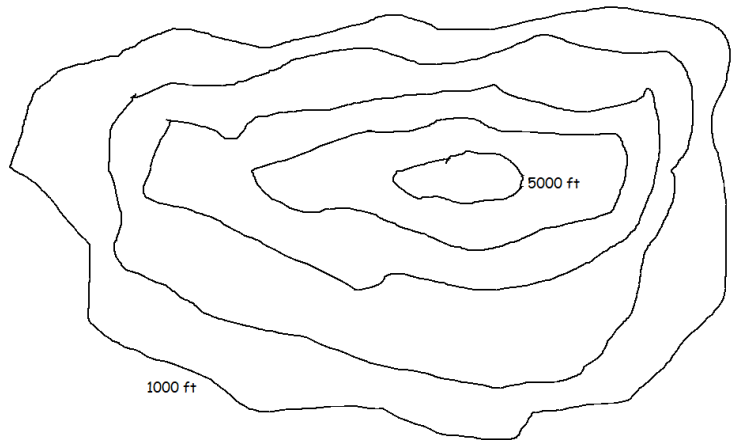
29. Which of the following would be the body's response to dehydration?
- A. Increase in body temperature
 B. Increase in respiratory rate
 C. Decreases urine production
 D. Increase sleep
30. A person consumes food that is contaminated by germs. The body's response to most quickly remove the germs would be to...
- A. Exhale rapidly
 B. Sneeze
 C. Cough
 D. Vomit
31. Some plants can be grown from leaf cuttings. These cuttings form the new plant. How does the genetic material of the offspring compare to the parent?
- A. Equal and identical
 B. Less than the parent
 C. More than the parent
 D. Equal but opposite
32. Which organelle store's the cells genetic material?
- A. 1
 B. 2
 C. 3
 D. 4
33. What types of particles are found in the cloud surrounding the atom's nucleus?
- A. Positively charged particles and negatively charges particles
 B. Negatively charges particles only
 C. Neutral charges particles and positively charged particles
 D. Positively charged particles only
34. Sodium sulfide's chemical formula is Na_2S . How many sulfur atoms are in this formula?
- A. 0
 B. 1
 C. 2
 D. 3
35. A kid jumps from a dock onto a jet ski, the jet ski dips into the water. This is an example of which of the following laws?
- A. 1st law of motion
 B. 2nd law of motion
 C. 3rd law of motion
 D. Law of gravitation
36. A mother is taking her child for a walk in a stroller. The amount of force needed to move the stroller most likely depends on the stroller's
- A. Mass
 B. Direction of movement
 C. Distance moved
 D. Rate at which it is moving
37. If a planet takes longer to experience a full day as compared to complete a full year. Which of the following is most likely the best explanation for this occurrence?
- A. It takes less time to rotate than it does to revolve
 B. It takes more time to rotate than it does to revolve
 C. It takes the same amount of time to rotate and revolve
 D. It deals with the tilt of the planet



38. A demonstration uses a flashlight and tennis ball to show the phases of the lunar cycle. What would be the best to add to this model?
- A. Asteroid
B. Sun
C. Earth
D. Comet
39. This theory suggests the universe is continually expanding and contracting:
- A. Oscillating universe
B. Anthropic universe
C. Kepler's universe
D. Ptolemy's universe
40. The light from our sun takes about eight minutes to reach the earth. Our nearby stellar neighbors include the Alpha Centauri group along with the Sirius star system. Light from these stars can reach the earth in –
- A. Seconds
B. Minutes
C. Years
D. Millenniums
41. Volcanic activity along the ring of fire is the best evidence of which of the following?
- A. Tidal flow
B. Continental plate movement
C. Solar cycles
D. Greenhouse effect

42. What is the contour interval of the map?

- A. 500 feet
B. 1000 feet
C. 1500 feet
D. 2000 feet



43. Hurricane's form over the oceans. Which area would most likely produce a violent storm system?
- A. Tropic of cancer
B. Tropic of Capricorn
C. Artic circle
D. Equator
44. Surface water evaporates into the atmosphere, condenses and eventually will return to earth as precipitation. What part of this system is most essential for a functioning water cycle?
- A. Radiant energy from the sun
B. The location of the oceans
C. Consumption of water by organisms
D. Amount of water plants use

45. Records show a town's annual high and low temperatures over the last two centuries. How should this data be properly displayed?
- A. Pie graph
 - B. Scatter plot
 - C. Bar graph
 - D. Double line graph
46. An autotrophic organism that successfully lives in an estuary must have an adaptation that will allow it to:
- A. Produce its own food
 - B. Absorb nutrients
 - C. Filter excess salt
 - D. Store excess oxygen
47. Students are investigating ways that glass tubing can be bent. Which of the following is the greatest safety hazard for this particular investigation?
- A. Electric shock
 - B. Broken glass
 - C. Toxic chemicals
 - D. Chemical reaction
48. Students mix sodium hydroxide and water together in a beaker. They note that there is an increase in the temperature of the beaker. Which form of energy best describes this observation?
- A. Radiant
 - B. Electrical
 - C. Sound
 - D. Thermal
49. Which of the following shows that the ozone layer over Antarctica is thinning?
- A. Decrease in levels of UV radiation being recorded
 - B. Increase in levels of UV radiation being recorded
 - C. Constant levels of UV radiation being recorded
50. A student designs an experiment to test exercise on breathing rates. What piece of equipment is needed to conduct this experiment?
- A. Timing device
 - B. Stethoscope
 - C. Spectrometer
 - D. Thermometer

**UNIVERSITY INTERSCHOLASTIC LEAGUE
2021 – 2022 SCIENCE
FALL/WINTER TEST**

Answer Key

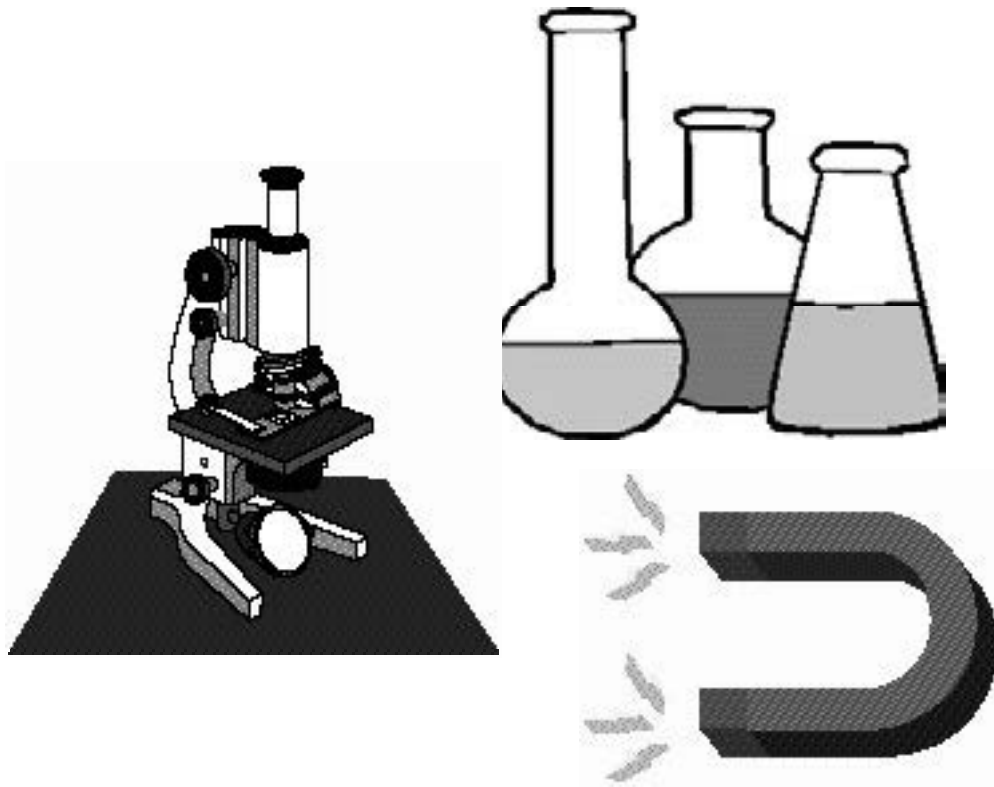
1. B	18.D	35.C
2. C	19.D	36.A
3. D	20.B	37.B
4. B	21.D	38.C
5. C	22.B	39.A
6. C	23.C	40.C
7. D	24.A	41.B
8. C	25.C	42.B
9. B	26.D	43.D
10.C	27.A	44.A
11.D	28.D	45.D
12.C	29.C	46.C
13.A	30.D	47.B
14.D	31.A	48.D
15.A	32.C	49.B
16.D	33.B	50.A
17.C	34.B	

SPRING DISTRICT 2021-2022

A+ ACADEMICS



University Interscholastic League



Science

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

UNIVERSITY INTERSCHOLASTIC LEAGUE
2021-2022 SCIENCE
SPRING TEST

1. Many evidences for chemical change occur by the sense of sight. Which of the following is not a chemical change evident by using sight?
 - A. Color change
 - B. Bubble formation
 - C. Precipitate formation
 - D. Strong odor

2. The density of carbon is 2.27 g/cm^3 . If a sample has a volume of 1.75 cm^3 , its mass must be which of the following?
 - A. 1.29 g
 - B. 3.97 g
 - C. .77 g
 - D. 4.02 g

3. This energy has the ability to generate electricity without emitting greenhouse gases but is reliant stable conditions in the environment. This energy can also cause environmental and social threats to humans, flora, and fauna. Based on these statements, which of the following energy is it referring too?
 - A. Coal
 - B. Oil
 - C. Radiant
 - D. Hydropower

4. Whipping eggs demonstrates which of the following?
 - A. Physical change
 - B. Chemical change

5. Based on the physical properties of a sample, which best classifies it?
 - ❖ Dull
 - ❖ Yellow
 - ❖ Powdery
 - ❖ Egg odor
 - ❖ Shatters when hammered
 - A. Metal
 - B. Metalloid
 - C. Nonmetal
 - D. Gas

6. A heat drying dishwasher dries dishes by primarily converting –
 - A. Heat to electrical
 - B. Electrical to mechanical
 - C. Electrical to heat to light
 - D. Electrical to heat to mechanical



7. The four activities occur:
- 1) Boy swimming laps in a pool
 - 2) Girl standing on a diving board
 - 3) Boy spiking a volleyball
 - 4) Girl holding a volleyball

Correctly identify each activity as kinetic or potential energy.

- A. 1 and 2 are PE; 3 and 4 are KE
B. 1 and 3 are KE; 2 and 4 are PE
C. 1 and 4 are PE; 2 and 3 are KE
D. 1 – 4 are KE
8. A car travels 25 kilometers in 30 minutes. What is the average speed of this car?
- A. 50 km/hr
B. .83 km/hr
C. 1.2 km/hr
D. 750 km/hr

9. A person roasting a marshmallow on the side of the fire gets thermal energy transferred to the marshmallow primarily by which of the following?
- A. Convection
B. Radiation
C. Conduction



10. Which list correctly characterizes organisms that are classified as mammals?
- A. Unicellular, prokaryotic, autotrophic
B. Unicellular, eukaryotic, heterotrophic
C. Multicellular, prokaryotic, autotrophic
D. Multicellular, eukaryotic, heterotrophic
11. Which one of the following tectonic plates listed is not one of the major tectonic plates?
- A. Caribbean plate
B. North American plate
C. Eurasian plate
D. African plate
12. There are numerous asteroids in our solar system. Most of them are located in the main asteroid belt between the orbits of which planets?
- A. Earth and Mars
B. Mars and Jupiter
C. Jupiter and Saturn
D. Venus and Mercury
13. What force causes Mercury to travel in a curved path around the Sun?
- A. The electromagnetic attraction between the Sun and Mercury
B. The electromagnetic attraction between Mercury and Venus
C. The gravitational attraction between Mercury and Venus
D. The gravitational attraction between Mercury and the Sun
14. Which of the following would not be associated with a divergent plate margin?
- A. Shallow focus earthquakes
B. Highly explosive volcanoes
C. Basaltic fissure eruptions
D. Sea floor spreading

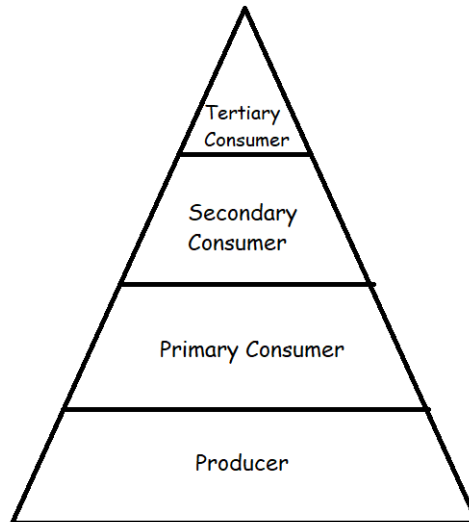
15. Someone gives you the following organisms:

Musca domestica and *Musca sorbens*

Based on the names of these organisms, which of the following is the same for these organisms?

- A. Genus
- B. Family
- C. Order
- D. All of these
- E. None of these

16. The flow of energy in a food chains is modeled in the energy pyramid shown.



Based on the model, which consumer would receive the greatest amount of energy captured by autotrophic organisms in this food chain?

- A. Producers
- B. Primary consumers
- C. Secondary consumers
- D. Tertiary consumers

17. Which of the digestive system processes would be best classified as a physical change?

- A. Saliva converting starch into sugars
- B. Bacteria breaking down food in the intestine
- C. Teeth crushing food in the mouth
- D. Bile breaking down lipids

18. When do plants naturally photosynthesize?

- A. Day time
- B. Night time
- C. Both day and night

19. Four people volunteer to move boxes. The following shows the boxes masses.



Box 1	5 kg
Box 2	10 kg
Box 3	11 kg
Box 4	30 kg

Box 1 was pushed two meters; Box 2 and 3 were pushed five meters each; and Box 4 could not be moved. Which box had no work done in this scenario?

- A. 1
- B. 2
- C. 3
- D. 4

20. Mechanical weathering produces which of the following?

- A. Clay minerals
- B. Quartz
- C. Smaller particles
- D. Calcium carbonate

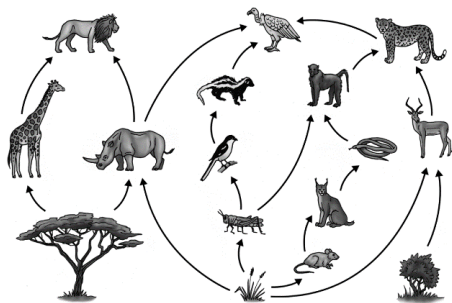
21. While energy can be transformed or transferred, the total amount of energy will

- A. Remain constant
- B. Constantly increase
- C. Constantly decrease

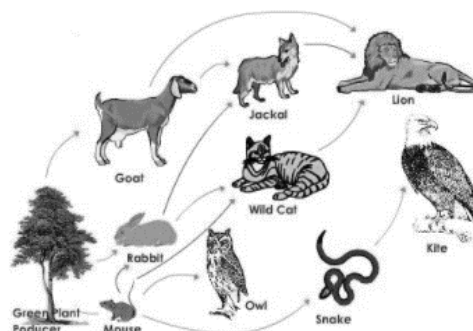
22. Why is it necessary for astronauts on the International Space Station to generate and recycle oxygen?

- A. It provides energy for fuel tanks
- B. It protects the space station from cosmic radiation
- C. There is not enough of it in space to sustain life
- D. It is a byproduct of human respiration

23.



Ecosystem 1



Ecosystem 2

Which ecosystem would be more likely to survive if a disease killed off the trees and shrubs?

- A. Ecosystem 1 because most of the animals could consume other organisms
- B. Ecosystem 2 because the predators can still compete for food
- C. Ecosystem 1 because it has numerous top predators
- D. Ecosystem 2 because it has more herbivores

24. During the winter storm of 2021, many people in Texas had their water pipes freeze due to prolonged temperatures below freezing. Based on this, which of the following statements is correct?
- A. Both hot and cold water froze at the same time due to the natural movement of heat
 - B. Hot water froze first due to the natural movement of heat from warmer to colder
 - C. Cold water froze first due to the natural movement of heat from colder to warmer
25. Which of the following structures can be found in all living cells?
- A. Ribosomes
 - B. Nucleus
 - C. Mitochondria
 - D. Cell wall
26. A cross country runner uses increased amounts of oxygen for their muscles during a meet. Which body system is responsible for getting the oxygen to the muscles?
- A. Respiratory
 - B. Integumentary
 - C. Nervous
 - D. Circulatory
27. Charles Darwin's voyage to the Galapagos Island and the study of the beak shape of the ground finches was integral to his research and subsequent ideas about ___ through ___.
- A. Speciation, evolution
 - B. Isolation, speciation
 - C. Evolution, natural selection
 - D. Degradation, genetics
28. Which of the following is not one of the main terrestrial biomes?
- A. Tundra
 - B. Temperature brush
 - C. Grassland
 - D. Rainforest
29. Using the information below, identify the species name of the smiley face shown.



Characteristics	Species
1. Teeth visible	Go to 2
Teeth not visible	Go to 4
2. Has a wide, toothy smile	Smilius toothus
Is not smiling	Go to 3
3. Visibly crying	Smilius dramaticus
Frowning	Smilius upsetius
4. Eyes are symmetrical	Go to 5
5. Eyes are shaped like hearts	Smilius valentines
Eyes are shaped like ovals	Smilius traditionalus

- A. Smilius traditionalus
- B. Smilius upsetius
- C. Smilius toothus
- D. Smilius dramaticus

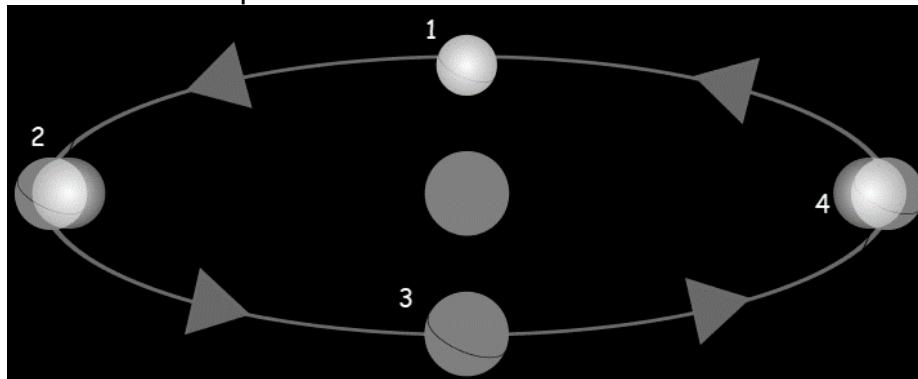
30. Correctly identify which of the following is not an external stimulus?
- Putting on a jacket because it is cold
 - A predator lunging at prey and it runs away
 - A cow feeling thirsty and drink water
 - Seeing a spider and then screaming
31. Which of the disorders listed follows classical Mendelian inheritance?
- Type I diabetes
 - Downs syndrome
 - Seasonal allergies
 - Cystic fibrosis
32. Haploid is a term used to describe a type of cell that contains:
- RNA
 - 1 set of chromosomes
 - 2 sets of chromosomes
 - A nucleus
33. Stimuli and response are related, which of the following best represents this correctly?
- Crime and punishment
 - Rise and fall
 - Trial and error
 - Cause and effect
34. Based on which of the following observations would most likely cause a new substance to form?
- A substance dissolves
 - A substance causes bubbles to form
 - A substance sank to the bottom of a liquid
 - A substance floated on top of a liquid
35. This chemical, also called noradrenaline, can sometimes act as a hormone as well. Its primary role is part of your body's stress response. It works with the hormone adrenaline to create the "fight-or-flight" feeling. The formula is shown below.
- $$\text{C}_8\text{H}_{11}\text{NO}_3$$
- How many atoms are in this molecule?
- 22
 - 23
 - 25
 - 4
36. The average acceleration of the plane is 2.5 m/s^2 . If a person has a mass of 60 kg, what net force in newtons did the person experience?
- .04 N
 - 24 N
 - 150 N
 - 375 N
37. A student uses a magnet to move a toy car with a mass of .25 kg. The magnet exerts a force of 5 N, which causes the toy cars to begin to move. What is the acceleration of this toy car when it begins to move?
- 20 m/s^2
 - 1.25 m/s^2
 - 5 m/s^2
 - $.05 \text{ m/s}^2$
38. If you travel to Alaska during the month of June. Which of the following statements is correct?
- There will be less hours of daylight than night
 - It will be winter
 - There will be more hours of daylight than night
 - The moon will be brighter in the night sky

39. Which of the following students correctly described a star?

Student	Description
1	A collection of hot gases that occasionally produces light due to nuclear reactions
2	A collection of dusts and gases that forms a sphere but does not produce light
3	A collection of gases from several nebula that are hot enough to produce light from fusion and fission
4	A sphere of matter with a density and a temperature that is great enough to have a nuclear reaction in the center of it

- A. Student 1
 B. Student 2
 C. Student 3
 D. Student 4

40. The diagram below shows four positions of the Earth's orbit around the sun.



The northern hemisphere will experience the beginning of spring when Earth is at position –

- A. 1
 B. 2
 C. 3
 D. 4

41. The color of a star is most closely related to its

- A. Age
 B. Mass
 C. Temperature
 D. Composition

42. A scale of 1:200 on a topographic map would indicate which of the following:

- A. One unit on the map would equal two hundred units in the real world
 B. The map represents the entire Earth
 C. One unit on the map is greater than one unit in the real world
 D. Two hundred units on the map equals one unit in the real world

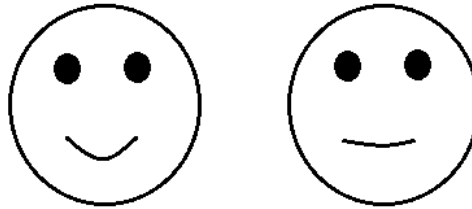
43. Which of the following cannot be directly attributed to the interaction of the lithospheres' plates?

- A. Appalachian Mountains
 B. Ontario Lake
 C. Himalayan Mountains
 D. East African Rift

44. If the Earth turned slightly faster on its axis, how might we be affected?
- A. Longer days and shorter nights; therefore temperature difference would be greater between night and day.
 - B. Shorter days and longer nights; therefore temperature difference would be less between night and day
 - C. Longer days and longer nights; therefore temperature difference would be greater between night and day
 - D. Shorter days and shorter nights; therefore temperature difference would be less between night and day

45. Use the following picture to determine the symbiotic relationship demonstrated.

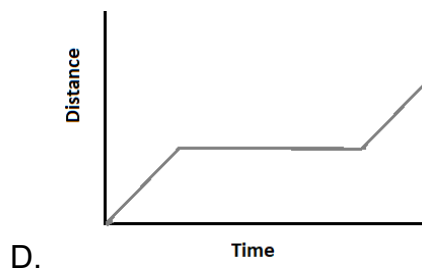
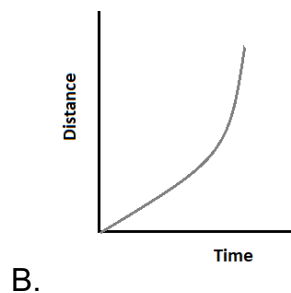
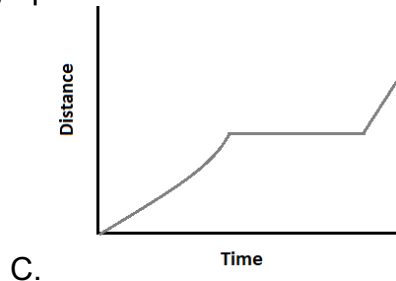
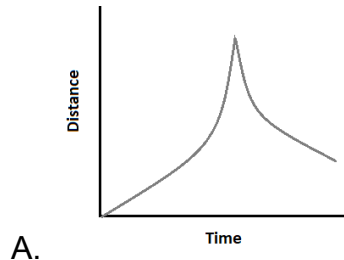
- A. Parasitism
- B. Mutualism
- C. Commensalism
- D. Predation



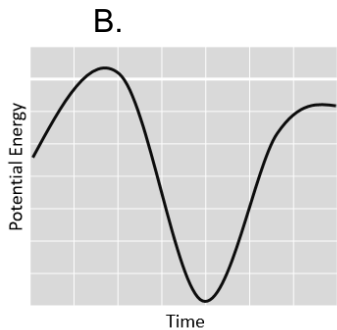
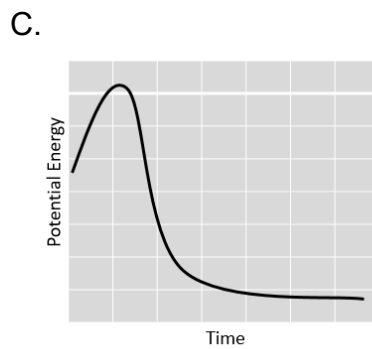
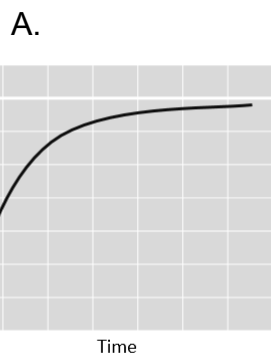
representation to relationship

46. Which of the following units is the largest?
- A. Petameter
 - B. Megameter
 - C. Gigameter
 - D. Terameter
47. A model of a planet drawn on notebook paper is not able to accurately show:
- A. How the planet looks in three dimensions
 - B. The scale of the planet
 - C. Location of satellites orbiting the planet
 - D. All of these
48. Which of the following is not equal to 1000 mL?
- A. 1 L
 - B. 100 cL
 - C. 1 cm³
 - D. 1 dm³

49. A student runs two laps on a track. Each lap is .25 km. It takes two minutes to run one complete lap and then the person sits for five minutes to rest before running the second lap in two minutes and 10 seconds. Which of the following graphs best illustrates this motion?



50. Which graph best illustrates a reaction in which energy is released?



**UNIVERSITY INTERSCHOLASTIC LEAGUE
2021-2022 SCIENCE
SPRING TEST**

Answer Key

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