

CONTESTANT NUMBER:

FOR GRADER USE ONLY

Score Test Below:

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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 level below.

Circle Level:

Science I

Science II

1. _____

19. _____

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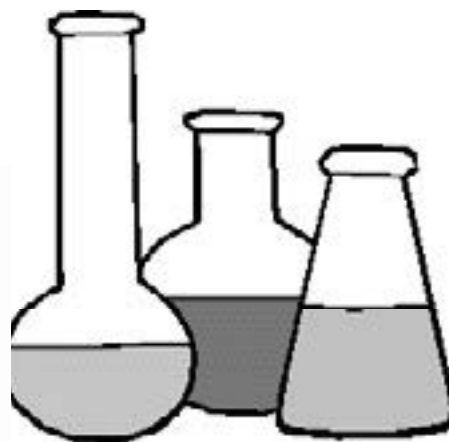
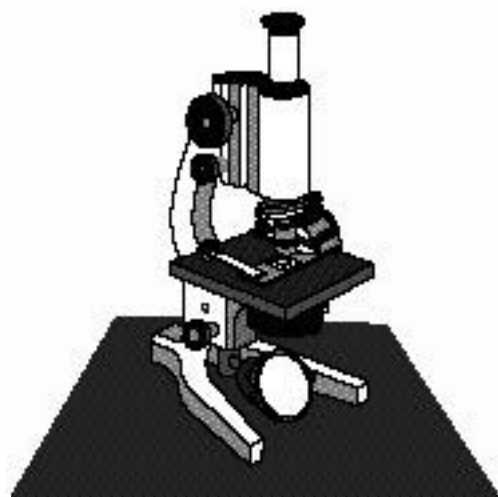
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INVITATIONAL 2019-2020

A+ ACADEMICS



University Interscholastic League



Science I

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

**UNIVERSITY INTERSCHOLASTIC LEAGUE
2019-2020 SCIENCE I
INVITATIONAL TEST**

1. In the lab, a student needs to precisely measure the volume of hydrogen peroxide for a decomposition reaction with an apple. What lab equipment is most appropriate?
 - A. Beaker
 - B. Graduated Cylinder
 - C. Dropper
 - D. Flask

2. A scientist determines the percentage of ethanol and other materials contained in gasoline used to refuel vehicles. The best way to show the results of this data is to use which of the following?
 - A. Circle Graph
 - B. Histogram
 - C. Line Graph
 - D. Bar Graph

3. The products of photosynthesis are a sugar, $C_6H_{12}O_6$, and oxygen, O_2 , which of the following correctly identifies the reactants in this equation?
 - A. Carbon monoxide and water
 - B. Nitrogen monoxide and water
 - C. Carbon dioxide and water
 - D. Nitrogen dioxide and water

4. About what percent of the energy at a trophic level is used to keep the organisms alive and is also converted into thermal energy?
 - A. 10%
 - B. 25%
 - C. 70%
 - D. 90%

5. A student removes a loaf of bread hot from the oven. The student cuts a slice off the loaf and spreads butter on it. Which of the following best describes this scenario in terms of physical or chemical changes?
 - A. Chemical because there is no change in substance or there is no unexpected color change, temperature change or gas given off.
 - B. Physical because there is no change in substance or there is no unexpected color change, temperature change or gas given off.
 - C. Physical because there is a change in the substance or there is color change, temperature change or gas given off.
 - D. Chemical because there is a change in the substance or there is color change, temperature change or gas given off.

6. A car driving down the highway is transforming the chemical energy in the gas tank to which of the following other energies?
 - A. Mechanical and chemical energy
 - B. Nuclear and mechanical energy
 - C. Mechanical and thermal energy
 - D. Thermal and electromagnetic energy

7. Which of the following will happen when a root bends in the direction of the force of gravity?
- A. The top side grows more than the bottom side
 - B. The bottom side grows more than the top side
 - C. The top and bottom side grow at the same rate
8. Which of the following is not an environmental impact that can be associated with flooding?
- A. Important in maintaining ecosystem habitats and soil fertility
 - B. Replenish groundwater
 - C. Constructions of channels, levees, and reservoirs
 - D. Decrease of contaminants in water
9. 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 change
 - B. Oxidation
 - C. Abrasion
 - D. Plant root growth
10. Which of the following would be something that could negatively affect the watershed?
- A. Pick up pet waste and properly dispose of it
 - B. Recycle liquids from vehicles instead of dumping them on the ground
 - C. Apply fertilizer before a heavy rain
 - D. Prevent runoff from driveways from directly going into surface water
11. Animals in this environment survive by living underground or resting in burrows during the middle of the day. Which biome does this best describe?
- A. Tundra
 - B. Savanna
 - C. Desert
 - D. Taiga
12. The earth's atmosphere is comprised of a mixture of various gases. Permanent gases don't fluctuate from day to day and would include all of the following except:
- A. N
 - B. CH₄
 - C. O₂
 - D. Ar
13. Which of the following doesn't cause a decrease in biodiversity?
- A. Climate stabilization
 - B. Habitat loss
 - C. Overexploitation
 - D. Invasive species
14. Which of the following is not a condition that is found in outer space?
- A. Vacuum
 - B. Microgravity
 - C. Extreme temperatures
 - D. Sparse atmosphere

15. 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 Coleoptera

- C. Order Diptera
- D. Order Lepidoptera

16. Which of the following is not an example of primary succession?

- A. Lava cooling and hardening to form new rocks
- B. Formation of sand dunes
- C. Glaciers exposing bare rocks after melting or receding
- D. Devastation of a forest after a fire

17. Which organ system contains the heart along with peripheral blood vessels?

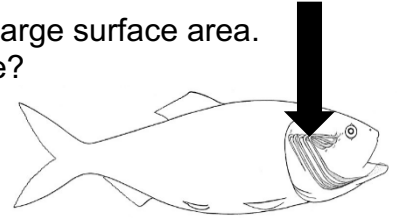
- A. Integumentary
- B. Circulatory
- C. Nervous
- D. Muscular

18. Which of the following is a behavioral adaptation to help organisms survive?

- A. Seasonal migration
- B. Colored males for mating
- C. Camouflage
- D. Body structures to cope with environments

19. Gills are organs that remove O_2 from H_2O . Gills have a relatively large surface area. The larger the surface area is, which of the following would be true?

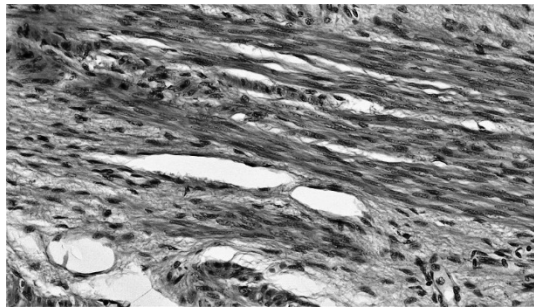
- A. There is no correlation based on surface area
- B. Constant amount of gas passing in and out of the blood
- C. Increased gas passing in and out of the blood
- D. Decreased gas passing in and out of the blood



20. Which of the following is only considered with selective breeding, not natural selection?

- A. Increased species chance of survival
- B. Traits are inherited from parents
- C. Changes occur over generations
- D. Doesn't always enhance the survival of the species

21. What level of biological organization is represented?



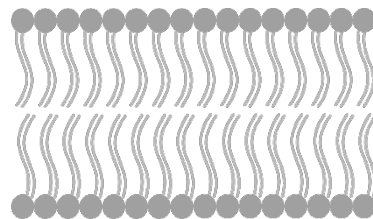
- A. Organ
- B. Organ system
- C. Cell
- D. Tissue

22. Which of the following is not an example of an external stimuli?

- A. An animal is cold so it moves into the sunlight
- B. A snake lunges at a mouse, so the mouse scurries away
- C. An animal goes to drink water after feeling thirsty
- D. A plant moves in the general direction of the radiant energy from the sun

23. This blocks uncontrolled movements of water soluble materials in and out of a cell.

- A. Cell wall
- B. Cytoplasm
- C. Nucleus
- D. Cell membrane



24. Which of the following doesn't show homeostasis?

- A. Warm blooded organisms
- B. Sleeping
- C. High blood sugar levels
- D. Normal functioning kidneys

25. In a Punnett square, if you have a 75% chance of expressing the dominant trait and a twenty five percent chance of expressing the recessive trait, which allele pair would most likely produce this:

- A. Aa x Aa
- B. AA x AA
- C. Aa x AA
- D. aa x aa

26. Which of the following organelles is most similar to the human digestive system?

- A. Mitochondria & Lysosomes
- B. Lysosomes & Vacuole
- C. Cell wall & Cell membrane
- D. Microtubules

27. Which of the following is not a way a hypothesis arises?

- A. Prior knowledge
- B. Logical inference
- C. Informed thoughts
- D. Well tested explanation

28. According to the cell theory, this is the basic unit of structure and function in a living organism.

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

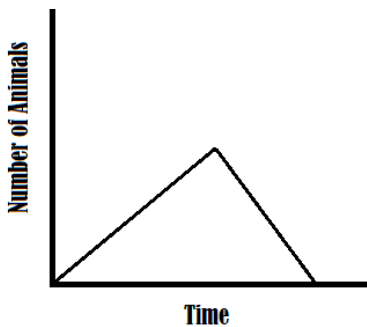
29. Which of the following shows vegetative propagation, a form of asexual reproduction?

- A. Mushroom spores
- B. Hydra budding
- C. Aphids laying eggs
- D. Sprouting buds on a potato

30. A device that produces an image by focusing light is a:

- A. Compound light microscope
- B. Scanning electron microscope
- C. Transmission electron microscope
- D. Spectroscope

31. What is an explanation that could describe what is occurring in the graph?

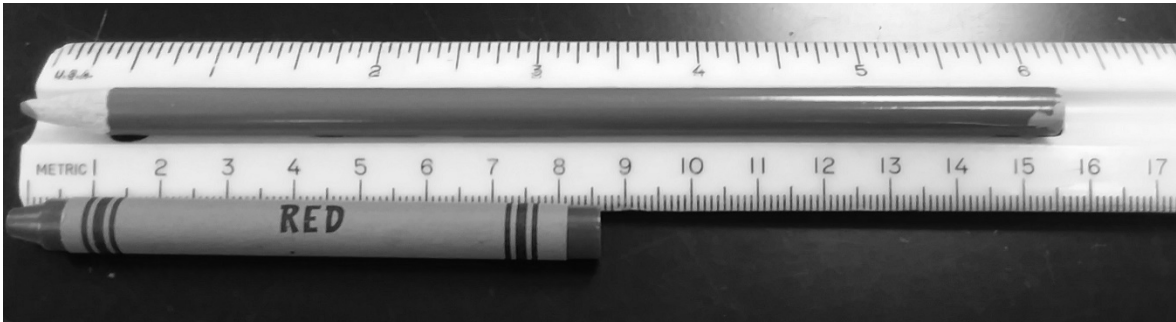


- A. As time changed, the number of animals increased
- B. Increases in the number of animals, then a decrease in the number of animals
- C. Several spikes in the population followed by a decline in the population
- D. The number of animals remains fairly constant

32. This person is credited with discovering that deoxyribose nucleic acid stores and transmits genetic information from one generation to the next.

- A. Griffith
- B. Franklin
- C. Avery
- D. Watson & Crick

33. How much longer is the map color than the crayon?



- A. 7 cm
- B. 8.6 cm
- C. 15.6 cm
- D. 24.2 cm

34. A student conducts an experiment to see how the increase of temperature affects the reaction rates of enzymes. The best way to display this data visually would be a:

- A. Data graph
- B. Bar graph
- C. Circle graph
- D. Line graph

35. You should see this safety symbol when a material could catch on fire easily.



**UNIVERSITY INTERSCHOLASTIC LEAGUE
2019-2020 SCIENCE I
INVITATIONAL TEST**

Answer Key

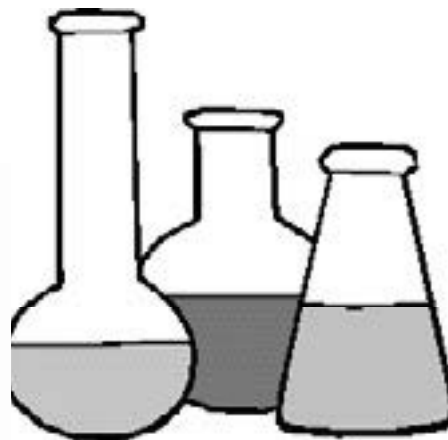
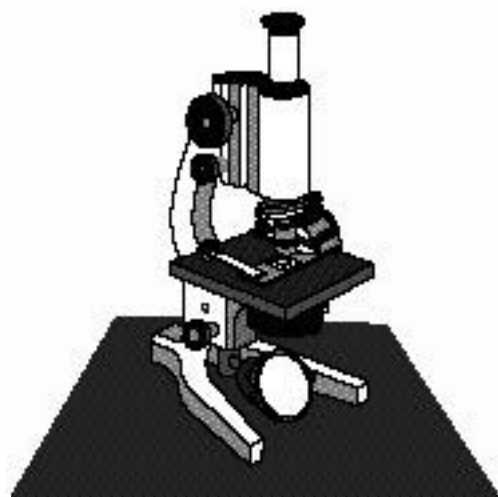
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| 1. B | 19. C |
| 2. A | 20. D |
| 3. C | 21. D |
| 4. D | 22. C |
| 5. B | 23. D |
| 6. C | 24. C |
| 7. A | 25. A |
| 8. D | 26. A |
| 9. B | 27. D |
| 10. C | 28. B |
| 11. C | 29. D |
| 12. B | 30. A |
| 13. A | 31. B |
| 14. D | 32. C |
| 15. B | 33. A |
| 16. D | 34. D |
| 17. B | 35. C |
| 18. A | |

INVITATIONAL 2019-2020

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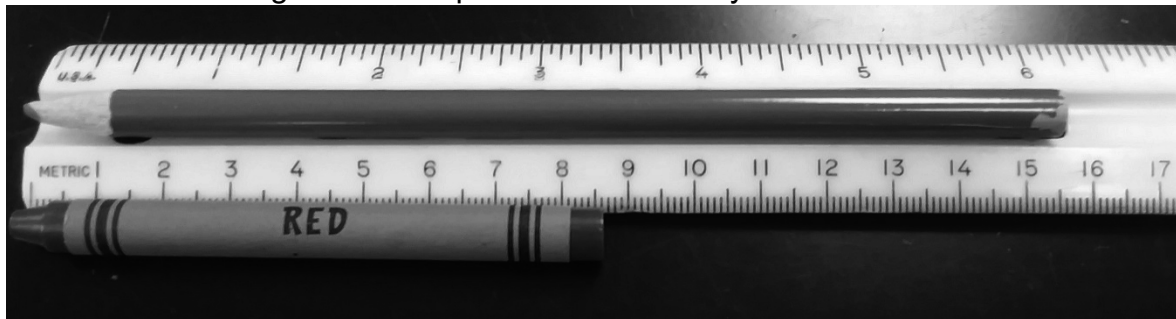


Science II

**DO NOT OPEN TEST
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**UNIVERSITY INTERSCHOLASTIC LEAGUE
2019-2020 SCIENCE II
INVITATIONAL TEST**

1. In the lab, a student needs to precisely measure the volume of hydrogen peroxide for a decomposition reaction with an apple. What lab equipment is most appropriate?
A. Beaker
B. Graduated Cylinder
C. Dropper
D. Flask
2. A scientist determines the percentage of ethanol and other materials contained in gasoline used to refuel vehicles. The best way to show the results of this data is to use which of the following?
A. Circle Graph
B. Histogram
C. Line Graph
D. Bar Graph
3. How much longer is the map color than the crayon?



- A. 7 cm
B. 8.6 cm
C. 15.6 cm
D. 24.2 cm
4. You should see this safety symbol when a material could catch on fire easily.



5. Which of the following constitute a nucleon?

I	proton
II	electron
III	neutron

- A. I only
- B. I & II

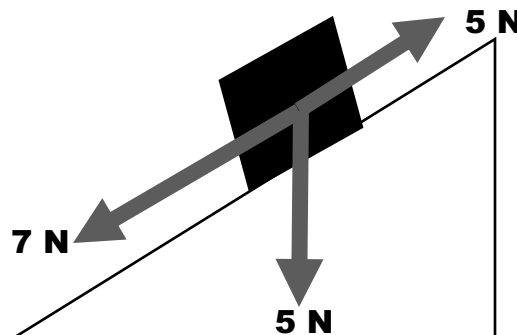
- C. I & III
- D. I, II, & III

6. For metals, the reactivity is as follows:

- A. Increases down the group
- B. Decreases down the group
- C. Remains unchanged
- D. Increases from left to right

7. Based on the diagram, will the object illustrated move?

- A. No
- B. Yes
- C. Cannot be determined



8. Correctly balance the equation by using your knowledge of the law of conservation of mass.



- A. 2,1,2
- B. 3,2,3

- C. 2,3,2
- D. 2,3,1

9. Given both water and hydrogen peroxide are clear liquids, how are the chemical formulas different?

- A. Both have H & O
- B. Both have the same formula
- C. Same number of O atoms but different number of H atoms
- D. Same number of H atoms but different number of O atoms

10. Which of the following is true based on the statement that follows?

A box moves on a conveyor belt at a constant speed.

- A. There is an increase in speed
- B. There is a decrease in speed
- C. There is changing acceleration
- D. There is no acceleration

11. These elements are found on the tops and right side of the periodic table. Generally these elements are poor at losing electrons but are good at gaining electrons. This description best fits which of the following?

- A. Metal
- B. Nonmetal
- C. Noble gases
- D. Inert gases

12. In winter, a person is skating on ice on a frozen pond. If the person pushes off a tree near the edge of the pond, they begin to slide forward. Based on Newton's first law of motion, which of the following is true?

- A. The person will lose their balance and fall over
- B. Gravity will make their velocity the same until an outside force stops the motion
- C. The person will continue to slide across the ice until a force is applied
- D. The size of the skate determines how quickly the person can move



13. The moon appears to be less than half illuminated from Earth after a new moon has occurred. What part of the lunar cycle is illustrated?

- A. Waning crescent
- B. Waxing crescent
- C. Waning gibbous
- D. Waxing gibbous

14. Which of the following is not a contact force?

- A. Gravitational force
- B. Applied force
- C. Frictional force
- D. Tension

15. A nebula is a cloud of dust and gas located in space. There are four types of main nebulae. Based on the description, what type of nebula is represented:

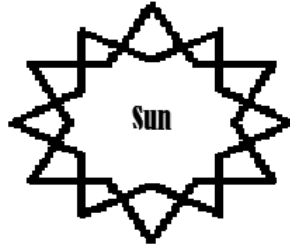
*This nebula does not create its own light,
but instead shines by bouncing of light from
nearby stars.*

- A. Planetary
- B. Absorption
- C. Refraction
- D. Reflection

16. Which of the following is not a layer of our sun?

- A. Radiation zone
- B. Bathypelagic zone
- C. Convection zone
- D. Core

17. What season would the southern hemisphere be in based on the graphic?



- A. Summer
- B. Fall

- C. Winter
- D. Spring

18. The moon's gravity is more noticeable on the ocean's tides. The moon's pull is strongest on which of the following?

- A. The side that is opposite of the side facing the moon
- B. Each side is the same
- C. The side that is directly facing the moon

19. The spacing of contour lines on a topographic map depends on the slope characteristics of the surface. Which statement is true?

- A. Wide spaces lines mean there is a steep slope
- B. Closely spaced lines mean there is a steep slope
- C. Closely spaced lines mean there is a gentle slope
- D. Wide spaces lines mean there is a varied or changing slope

20. Astronomers captured the first image of a black hole in the spring of 2019 using which of the following telescopes?

- A. Radio
- B. Refracting
- C. Reflecting
- D. Infrared

21. This front occurs when a warm air mass & a cold air mass meet, but neither one of the air masses has enough force to move the other mass. This statement best describes a:

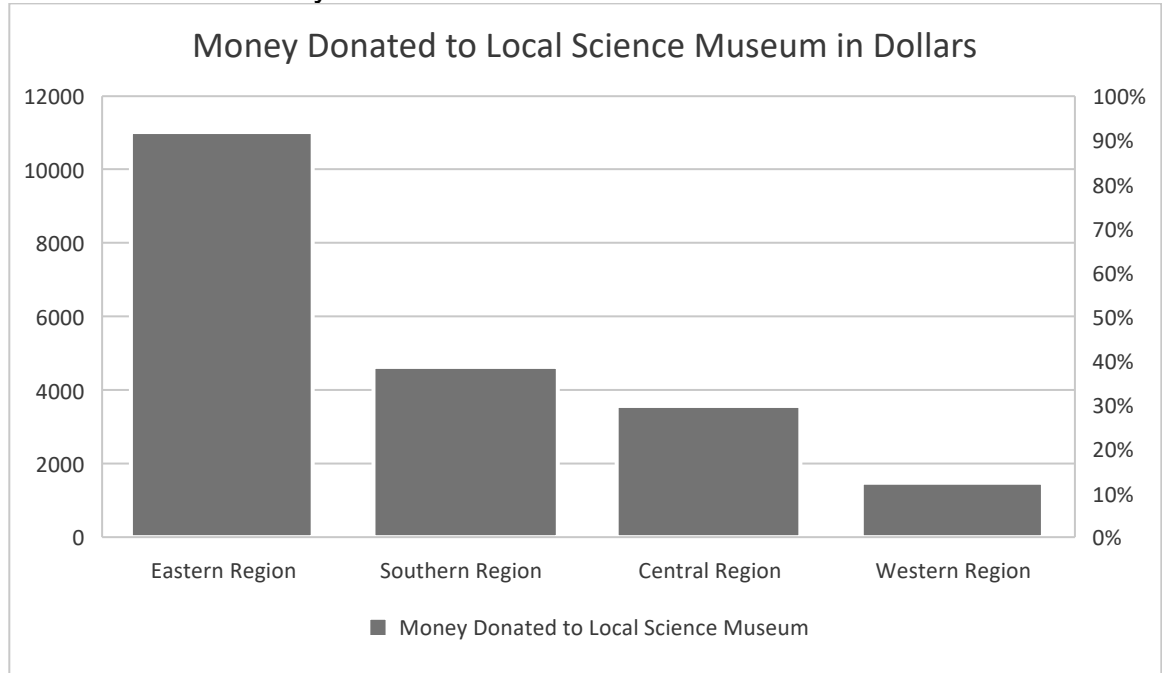
- A. Standing front
- B. Static front
- C. Immobile front
- D. Stationary front

22. His hypothesis was originally referred to as the primeval atom or the cosmic egg.

- A. Lemaitre
- B. Friedmann
- C. Planck
- D. Hubble

23. This describes one of the earliest ways geologists thought continents moved over time. Today it has been replaced by new scientific discoveries.
- A. Plate tectonics
 - B. Floating plates
 - C. Continental drift
 - D. Pangea
24. Wind is created by differences in which of the following?
- A. Air pressure caused by unequal heating
 - B. Reflection
 - C. Air pressure caused by equal heating
 - D. Refraction
25. Safety goggles and aprons must be worn when handling chemicals that are corrosive because the chemicals:
- A. May stain clothing
 - B. React with skin
 - C. Are difficult to transfer
 - D. Are highly flammable
26. Which of the following is not an abiotic factor?
- A. Sand
 - B. Oxygen
 - C. Fungi
 - D. Clouds
27. For hurricanes to form over the oceans near the equators, they need low pressure, wind shears, and water temperatures
- A. Below 20°C
 - B. Over 25°C
 - C. Over 80°C
 - D. Near 100°C
28. What environmental conditions favored dark colored moths during the industrial revolution after 1845 in England?
- A. The smoke and soot deposits on the environment
 - B. Light colored environment
 - C. Dark colored paints on buildings
 - D. Dark cloudy skies
29. A fossil of an ancient feathered organism is discovered. Which of the following is the most useful in judging if the organism was capable of flight?
- A. The type of rock the fossil was discovered in
 - B. The geographic location of the fossil
 - C. The shape and size of the fossil
 - D. The age of the fossil based on carbon dating
30. Many marine ecologists think this is the biggest single threat to the marine ecosystems on Earth.
- A. Oil spills
 - B. Overfishing
 - C. Coastal cleanups
 - D. Sewage

31. The following shows the values of money donated to a science museum. About what percent was donated by the south?



- A. 7%
- B. 22%
- C. 12%
- D. 54%

32. What is the SI unit for electric current?

- A. Ampere
- B. Watt
- C. Hertz
- D. Volts

33. Which of the following is considered a SI derived unit for acceleration?

- A. Miles per hour
- B. Meters per second squared
- C. Miles per second squared
- D. Meters

34. In an experiment there are two marbles, one glass and one metal. The marbles are the same size. The metal marble is gently placed into a graduated cylinder and it sinks to the bottom and the water level rises to the 7th mark above the initial volume of the water. If the glass marble is put into a graduated cylinder with the same initial volume as that of the metal marble, the water for the glass marble will:

- A. Be the same level as it was in cylinder 1
- B. Be at a higher level than cylinder 1
- C. Be at a lower level than cylinder 1

35. How many kilograms are there in 4.5 pounds? (2.2 lbs = 1 kg)

- A. 9.26 kg
- B. 2.05 kg
- C. 9.9 kg
- D. .48 kg

**UNIVERSITY INTERSCHOLASTIC LEAGUE
2019-2020 SCIENCE II
INVITATIONAL TEST**

Answer Key

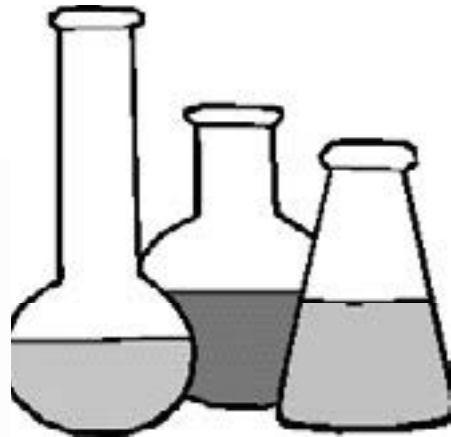
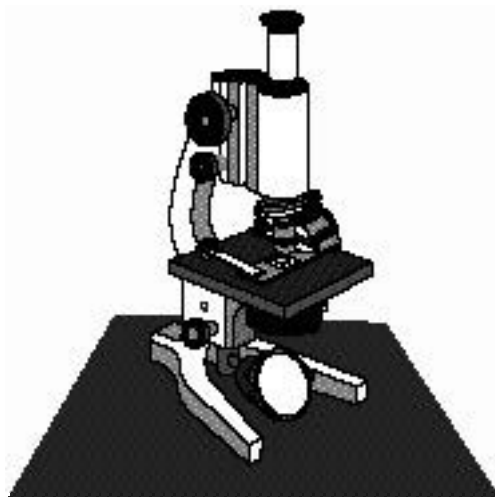
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| 1. B | 19.B |
| 2. A | 20.A |
| 3. A | 21.D |
| 4. C | 22.A |
| 5. C | 23.C |
| 6. A | 24.A |
| 7. B | 25.B |
| 8. C | 26.C |
| 9. D | 27.B |
| 10.D | 28.A |
| 11.B | 29.C |
| 12.C | 30.B |
| 13.B | 31.B |
| 14.A | 32.A |
| 15.D | 33.B |
| 16.B | 34.C |
| 17.A | 35.B |
| 18.C | |

FALL/WINTER DISTRICT 2019-2020

A+ ACADEMICS



University Interscholastic League



Science I

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

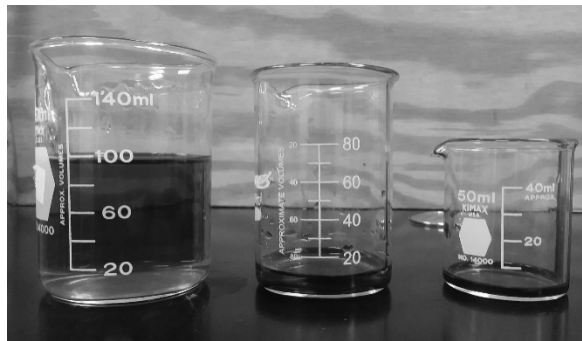
**UNIVERSITY INTERSCHOLASTIC LEAGUE
2019-2020 SCIENCE I
FALL/WINTER TEST**

1. What is the energy source that heterotrophs use to produce ATP via respiration which originated in autotrophs via photosynthesis?
 - A. Carbohydrate
 - B. Oxygen
 - C. Lipids
 - D. Carbon

2. Cracking an egg would be considered which of the following?
 - A. Chemical change
 - B. Chemical property
 - C. Physical property
 - D. Physical change

3. All matter is made up of atoms and molecules. When particles move faster which will increase?
 - A. Radiant energy
 - B. Thermal energy
 - C. Chemical energy
 - D. Mechanical energy

4. This picture can represent which of the following in an ecosystem?



- A. Water cycle
 - B. Life cycle
 - C. Flow of energy
 - D. Homeostasis

5. What must a seedling do to emerge from the soil?
 - A. Seed's turgor pressure must be more than the gravitational force
 - B. Seed's turgor pressure must be less than the gravitational force
 - C. Decrease force causes it to collapse
 - D. Force due to the water pushing inward on the cell causes it to grow

6. Which of the following is not an effect of a tornado on an ecosystem?
 - A. Loss of plants can allow for a new species
 - B. Surviving plants become more abundant
 - C. Loss of vegetation can lead to soil erosion
 - D. The soil becomes more fertile

7. Which of the following conditions is a reason accommodations are needed for manned space exploration?
- A. Constant temperatures
 - B. Space is a vacuum
 - C. Constant 1G force
 - D. Macrogravity
8. The water table may be shallow or deep, and may fluctuate depending on numerous factors. Where is the general location of the water table?
- A. Unsaturated zone
 - B. Saturated zone
 - C. Between the saturated & unsaturated zones
9. In this ecosystem in Texas, clear cutting causes the soil to be easily eroded by wind and water. Plowing also increases soil erosion. This would best describe which of the following ecosystems?
- A. Gulf coast marshes
 - B. Blackland prairies
 - C. Piney woods
 - D. Trans-Pecos
10. Which of following will have the lowest biodiversity?
- A. Warm and wet climate
 - B. Coral reef
 - C. Rain forest
 - D. Small island in an ocean
11. Scientists believe that life can occur outside the habitable zone. Which of the following is not believed to have water that could possibly support life?
- A. Mars
 - B. Mercury
 - C. Europa
 - D. Enceladus



12. A forest ecosystem is disrupted by fire. Which of the following statements is true?
- A. Bare rocks form initial landscapes
 - B. The ecosystem transitions to a climax community
 - C. The soil remains for the pioneer species
 - D. The forest is not changed by the fire
13. This biome is characterized by an extremely cold climate; low biotic diversity, and short season of growth and reproduction. This best represents which of the following?
- A. Desert
 - B. Tundra
 - C. Forest
 - D. Grassland
14. Which of the following mammals has not adapted for dormancy or hibernation?
- A. Raccoon
 - B. Turtle
 - C. Opossum
 - D. Bea

15. Which of the following structures in a bird is adapted to aide in flight?
- A. Cloaca
 - B. Gizzard
 - C. Beak
 - D. Chest muscles
16. Which would an animal breeder use to produce animals that would produce more milk?
- A. Natural selection
 - B. Genetic drift
 - C. Artificial selection
 - D. Overproduction
17. This type of tissue covers the human body and lines various internal structures, this would be considered:
- A. Muscle tissue
 - B. Connective tissue
 - C. Epithelial tissue
 - D. Nervous tissue
18. Using the following information, identify the insect.

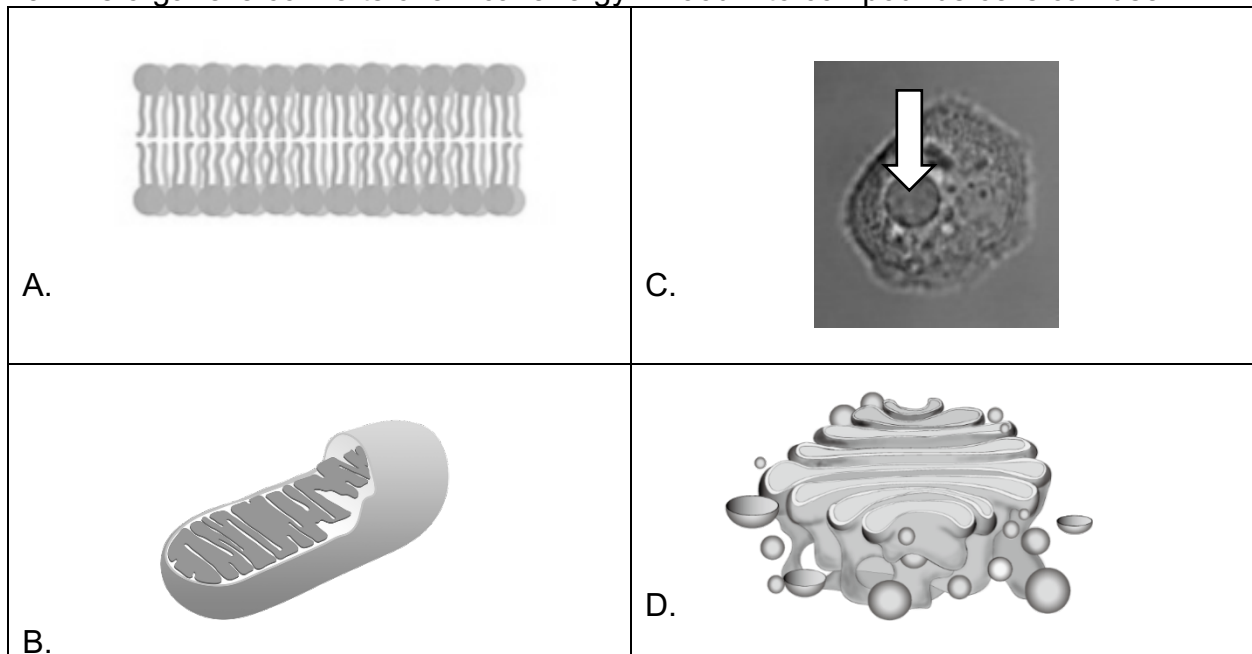


1. Does the insect have wings? Remember most adult insects have 2 pairs of wings, but they're not always visible.	a. Yes	go to step 2
	b. No	Order Hemiptera
2. Does the insect have parallel wings?	a. Yes	go to step 3
	b. No	go to step 4
3. Does the insect have a parallel line down the back that divides 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 Coleoptera

- C. Order Diptera
- D. Order Lepidoptera

19. The function of this system is to control growth, developments, and metabolize. Which of the following systems does this best describe?
- A. Endocrine system
 - B. Digestive system
 - C. Circulatory system
 - D. Reproductive system
20. The circulatory system transports materials around the entire body, this is most similar to which of the following organelles?
- A. Golgi apparatus
 - B. Lysosome
 - C. Endoplasmic reticulum
 - D. Cell wall
21. This individual concluded that all plants are made of cells, furthering the development of the cell theory.
- A. Hooke
 - B. Plowe
 - C. Virchow
 - D. Schleiden
22. The response to the length of light and the absence of light is referred to as:
- A. Geotropism
 - B. Thigmotropism
 - C. Photoperiodism
 - D. Chemotropism
23. This organelle converts chemical energy in food into compounds cells can use?



24. If two black and white mice are bred and it results in all of the offspring being gray, what inheritance pattern is this?

- A. Codominance
- B. Dominance
- C. Incomplete dominance
- D. Multiple alleles

25. Which of the following is not a cause of a fever?

- A. Lethargy
- B. Infection
- C. Dehydration
- D. Certain medications

26. To keep the number of chromosomes the same in an organism, the gametes must:

- A. Be diploid
- B. Be formed by meiosis
- C. Be recessive
- D. Be formed by mitosis

27. While studying meiosis, it is observed that gametes receive only one copy of sex chromosomes. This observation is a physical explanation of which of the following?

- A. Law of Dominance
- B. Law of Random Distribution
- C. Law of Independent Assortment
- D. Law of Segregation

28. A hydrogen atom is about ten nanometers in diameter. What is this diameter in millimeters?

- A. 1×10^{-8} mm
- B. 1×10^{-5} mm
- C. 1×10^{-2} mm
- D. 1×10^{-9} mm

29. Which of the following materials should have the proper disposal symbol associated with it in lab?

- A. Paper
- B. Water
- C. Lemon juice
- D. Battery



30. A student is calculating the density of an aluminum cube. The mass of the cube is taken three times. The masses were recorded as 32.7g, 32.1g, 33.2g. The label on outside of the box the cube came in states that the mass of the cube is 33.3 grams. Since the mass measurement obtained is different from the actual value, how will this affect the density calculation?

- A. There will be no change in the value for density
- B. There will be no change in the value for density since volume could be miscalculated
- C. The density value will be lower than the actual value
- D. The density value will be higher than the actual value



31. A person arrives home and turns on a lamp upon entering a room. The lights do not come on. The person's hypothesis is that the light is burned out, is this valid?
- A. Yes; that is always the problem when lights do not work
 - B. Yes; it can be tested by replacing the bulb
 - C. No; because this is not a scientific problem
 - D. No; the lamp is probably unplugged
32. During a lab, rubbing alcohol is splashed in another student's eyes. What should be done?
- A. Walk to the nurse's office
 - B. Put on safety goggles
 - C. Flush eyes immediately with water
 - D. Wipe eyes with a damp paper towel
33. Newton made discoveries that enabled people to understand which of the following?
- A. Atomic structures
 - B. Planetary motion
 - C. Properties of elements
 - D. States of matter
34. Which of the following units would be best to use when describing the height of a room?
- A. Nanometer
 - B. Centimeter
 - C. Meter
 - D. Kilometer
35. Which of the following historical accomplishments provided the first convincing evidence that the Earth was not the center of the universe?
- A. Copernicus's explanation for the motion of Mars
 - B. Aristotle's careful observations of planetary motions
 - C. Brache's observations that most stars were outside of this solar system
 - D. Galileo's observations that Venus went through phases like the moon

**UNIVERSITY INTERSCHOLASTIC LEAGUE
2019-2020 SCIENCE I
FALL/WINTER TEST**

Answer Key

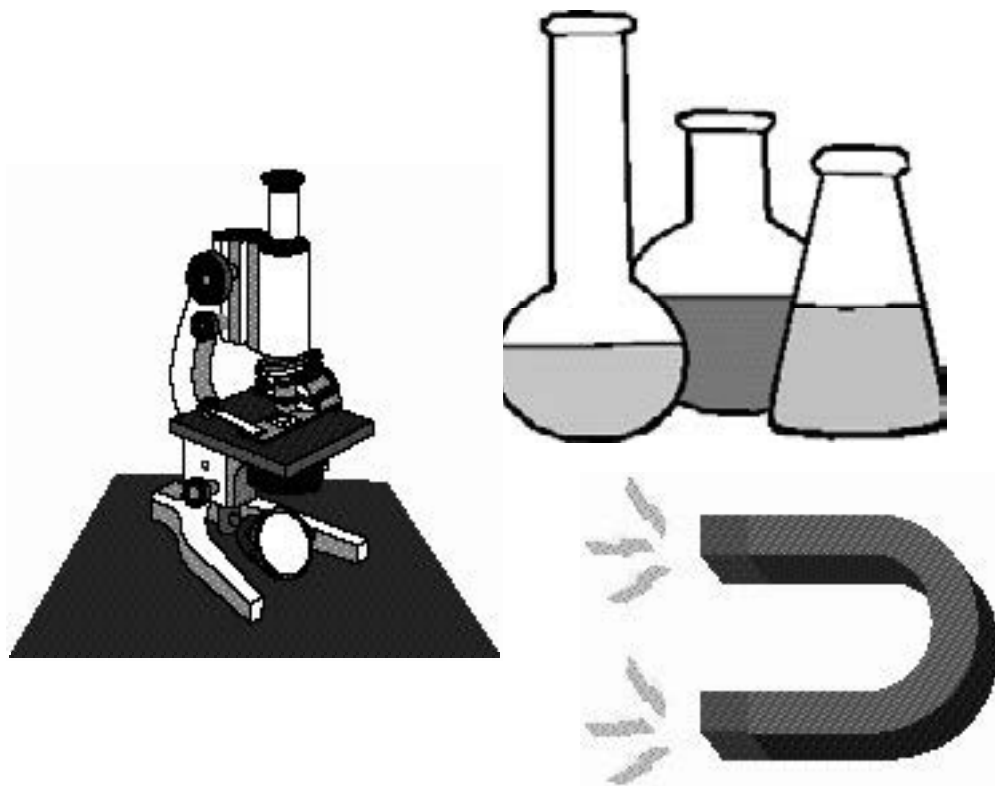
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|-------|------|
| 1. A | 19.A |
| 2. D | 20.C |
| 3. B | 21.D |
| 4. C | 22.C |
| 5. A | 23.B |
| 6. D | 24.C |
| 7. B | 25.A |
| 8. C | 26.B |
| 9. B | 27.D |
| 10. D | 28.B |
| 11. B | 29.D |
| 12. C | 30.C |
| 13. B | 31.B |
| 14. C | 32.C |
| 15. D | 33.B |
| 16. C | 34.C |
| 17. C | 35.D |
| 18. D | |

FALL/WINTER DISTRICT 2019-2020

A+ ACADEMICS



University Interscholastic League



Science II

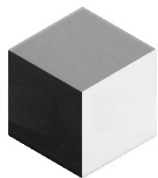
**DO NOT OPEN TEST
UNTIL TOLD TO DO SO**

**UNIVERSITY INTERSCHOLASTIC LEAGUE
2019-2020 SCIENCE II
FALL/WINTER TEST**

1. A hydrogen atom is about ten nanometers in diameter. What is this diameter in millimeters?
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- A. Copernicus's explanation for the motion of Mars
- B. Aristotle's careful observations of planetary motions
- C. Brache's observations that most stars were outside of this solar system
- D. Galileo's observations that Venus went through phases like the moon

9. Most of the elements to the left of the stair step line in the periodic table exist as ___ at room temperature.

- A. Gases
- B. Liquids
- C. Plasma
- D. Solids

10. Which element is most similar to Xenon?

- A. Al
- B. Ar
- C. Ag
- D. As

11. How many outermost electrons do Potassium and Cesium have?

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

12. Two students are pushing on a refrigerator from the same side. Which of the following would be a true statement?

- A. The forces would add together since they are in the same direction
- B. The forces would be subtracted from each other since they are in the opposite direction
- C. The forces would be added together since they are in the opposite direction
- D. The forces would be subtracted from each other since they are in the same direction

13. Which of the following subatomic particles is not found in the nucleus of an atom?

- A. Quark
- B. Proton
- C. Electron
- D. Neutron

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14. This states that matter is neither created nor destroyed in a chemical reaction?
- A. Law of conservation of mass
 - B. Law of conservation of matter
 - C. Law of conservation of energy
 - D. Law of conservation of momentum
15. Which of the following takes about one month to complete?
- A. Day & night
 - B. Seasons
 - C. Eclipse
 - D. Phases of the moon
16. A person determines the weight of a bunch of bananas using a spring scale. Which law best applies to this scenario?
- A. Newton's first law of motion
 - B. Newton's second law of motion
 - C. Newton's third law of motion
 - D. Newton's fourth law of motion
17. How many seasons can occur at the same time on Earth?
- A. 1
 - B. 2
 - C. 3
 - D. 4
18. A Hertzsprung Russell diagram shows the relationship between a star's surface temperature and brightness. Which of the following is not used to indicate brightness?
- A. Candela
 - B. Absolute magnitude
 - C. Luminosity
19. The moon has a greater effect on ocean tides compared to the sun because the moon is...
- A. Smaller than the earth
 - B. Heavier than the sun
 - C. Farther from earth
 - D. Closer to earth
20. Based on the graph, what quantity is represented by the slope of the line?
- A. Speed
 - B. Acceleration
 - C. Force
 - D. Displacement



21. Heat is transferred to object in three ways but the least visible form for humans observe using the naked eye comes from:
- A. Convection
 - B. Conduction
 - C. Radiation
22. Who discovered that our sun was not at the center of the Milky Way?
- A. Herschel
 - B. Shapley
 - C. Hubble
 - D. Einstein
23. Humidity is the amount of water vapor in the air. Which of the following factors does humidity depend on?
- A. Light
 - B. Wind
 - C. Temperature
 - D. Time of the day
24. This visible light telescope is surveying a part of the Milky Way galaxy to discover planetary systems.
- A. Swift
 - B. GALEX
 - C. NuSTAR
 - D. Kepler
25. Traditionally hurricane season in the United States is from:
- A. June to November
 - B. July to January
 - C. January to March
26. In order to demonstrate the expanding universe, which would be used?
- A. Building blocks
 - B. Expanding balloon with dots
 - C. Planetary system model
 - D. Water flowing in a hose
27. Why is nitrogen in runoff bad for an aquatic environment like the ocean?
- A. It causes hypoxic areas in the water
 - B. It can change the balance of plant growth and has consequences for wildlife
 - C. It increases the biodiversity in that part of the ocean
28. Tectonic plates are pieces of the ____ that move around on top of the ____.
- A. Mesosphere; lithosphere
 - B. Asthenosphere; mesosphere
 - C. Lithosphere; mesosphere
 - D. Lithosphere; asthenosphere

29. What resources are the organisms in the picture competing for?

- A. Space
- B. Food
- C. Shelter
- D. Sunlight



30. There are three kinds of plate tectonic boundaries. Which of the following boundaries makes oceanic crust made of basalt?

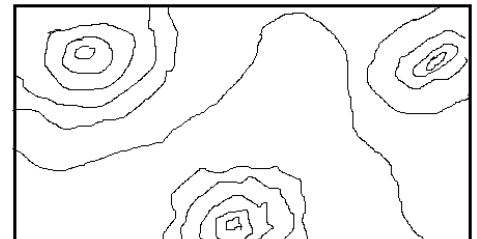
- A. Convergent
- B. Divergent
- C. Transformative
- D. Triple point

31. This type of environmental change doesn't give populations time to adapt to the change and forces them to move or to become extinct. Which of the following scenarios does cause this type of change?

- A. Drought
- B. Flood
- C. Fire
- D. Natural temperature fluctuations

32. How many hilltops are shown on the map?

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



33. A student wearing goggles, apron, and gloves would be best protected from:

- A. Cuts from a knife
- B. Burns from handling a hot flame
- C. Electrostatic discharge
- D. Burns from mixing chemicals in a beaker

34. John Dalton depicted his model of the atom as a solid sphere. The model of the atom has undergone many changes since then. What is the best scientific reason for these changes in the model?

- A. Computer generated graphics
- B. People are more open to changes
- C. Modifying ideas based on discoveries
- D. People want the truth

35. The following temperatures were measured as a liquid was boiling. If the real boiling point of this substance is 29.5 °C, which is the most precise?

Trial	Temperature in °C
1	28.5
2	32.5
3	27.5
4	30

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

**UNIVERSITY INTERSCHOLASTIC LEAGUE
2019 – 2020 SCIENCE II
FALL/WINTER TEST**

Answer Key

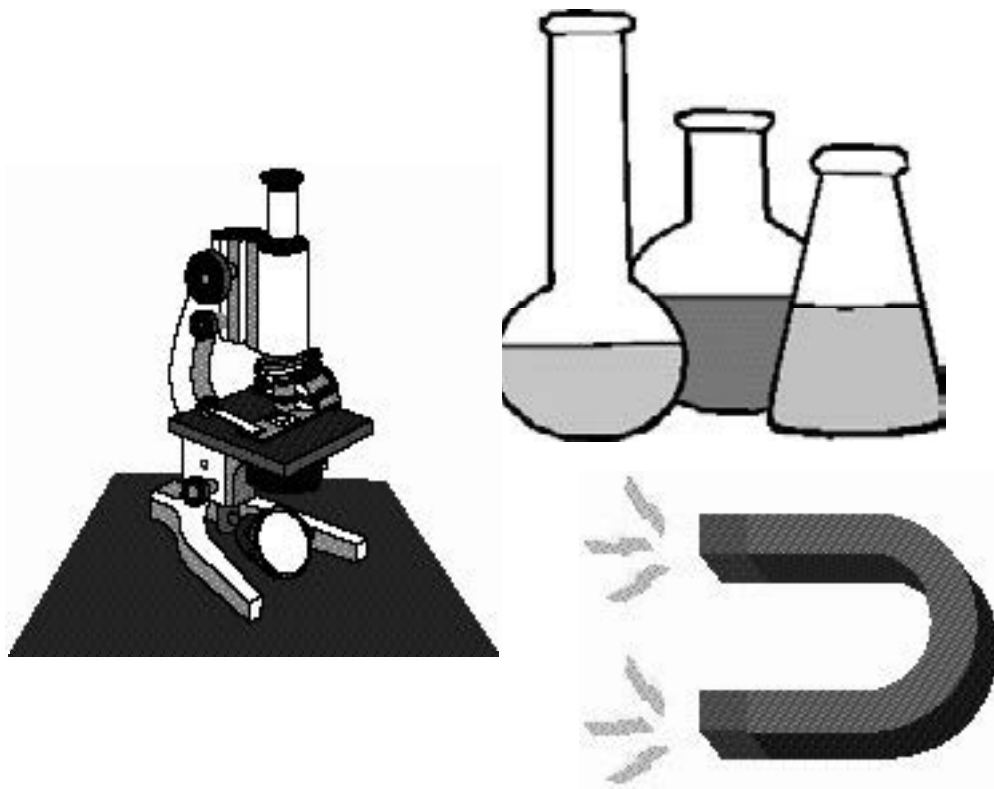
- | | |
|------|------|
| 1. B | 19.D |
| 2. D | 20.A |
| 3. C | 21.C |
| 4. B | 22.B |
| 5. C | 23.C |
| 6. B | 24.D |
| 7. C | 25.A |
| 8. D | 26.B |
| 9. D | 27.B |
| 10.B | 28.D |
| 11.A | 29.B |
| 12.A | 30.B |
| 13.C | 31.D |
| 14.B | 32.C |
| 15.D | 33.D |
| 16.B | 34.C |
| 17.B | 35.D |
| 18.A | |

SPRING DISTRICT 2019-2020

A+ ACADEMICS



University Interscholastic League



Science I

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

**UNIVERSITY INTERSCHOLASTIC LEAGUE
2019-2020 SCIENCE I
SPRING TEST**

1. Suppose the SDS for a chemical states that it is a highly volatile substance and is a nose and throat irritant. Which safety procedure should be followed based on the SDS information?
- A. Use substance in minute amounts
 - B. Add water to the substance
 - C. Use in a ventilated area, such as a fume hood
 - D. Store substance in a dark colored container

2. The lab equipment shown are being used, what task would require these specific tools?



- A. Measuring the area of the classroom
 - B. Determine the speed of a rolling ball
 - C. Making an atomic model
 - D. Measuring the density of a solid
3. A student breaks a flask during a lab procedure. After telling the teacher, what should be done based on proper lab safety protocols?
- A. Find a new flask
 - B. Tell an addition teacher
 - C. Find a mop and dust pan
 - D. Dispose of broken glass into proper container
4. In what part of the picture is radiant energy from the sun being converted into chemical energy?

- A. Grass
- B. Bird
- C. Worm
- D. Rock



5. What does this symbol indicate about a substance?

- A. Can cause injury to skin
- B. Can catch on fire easily
- C. Hazardous to the environment
- D. Harmful to inhale



6. What do arrows represent in a food chain?

- A. The size of the organism
- B. Dominance of the organism
- C. The flow of energy
- D. What an organism eats

7. Which of the following is an unsafe practice during a lab?

- A. Detecting an odor by inhaling repeatedly
- B. Watering a flower without using gloves
- C. Wearing goggles while mixing chemicals
- D. Using a stirring rod to circulate liquids

8. An experiment was done to test the effect of water poured on to a hot metal. Which tool would be used to measure the transfer of energy between the hot metal and the water?

- A. Spring scale
- B. Balance
- C. Thermometer
- D. Spectrometer

9. A teacher fills a sealable bag with jelly, colored beads, and various hard candies to model a cell. Which of the following cannot be shown through this model?

- A. The organelles of the cell
- B. The flexibility of the cell
- C. The nucleus of the cell
- D. The absorption of nutrients

10. Energy stored in food is ____; as it is digested the food releases ____ energy for motion. Correctly complete this statement.

- A. Chemical; thermal
- B. Chemical; mechanical
- C. Radiant; mechanical
- D. Thermal; radiant

11. Which of these processes does not describe a physical change in digestion?

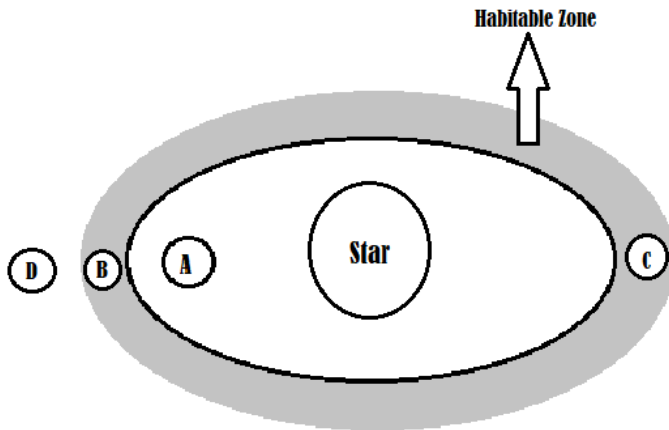
- A. Teeth tearing food into smaller pieces
- B. Tongue shaping food as it pushes it into the esophagus
- C. Saliva in mouth breaking down starch
- D. Food being broken down by stomach muscles

12. Some animals migrate across Africa in search of resources, such as grass for food. A drought would likely cause a migrating animal to:

- A. Migrate shorter distances
- B. Migrate farther distances
- C. Produce a larger herd
- D. Start eating meat as their primary food source

13. Which shows an organ applying a force?
- A. Gallbladder squeezing bile into the small intestine
 - B. Eye sending signals to the brain
 - C. Kidneys filtering
 - D. Salvia in the mouth breaking down food
14. Longhorn Cavern in Texas was created when limestone was carved out by running water, making its walls mostly smooth. This process best describes which of the following?
- A. Weathering
 - B. Deposition
 - C. Erosion
15. The Texas Water Development Board states groundwater is used about 80% of the time for which of the following activities?
- A. Irrigating crops
 - B. Supplying residence
 - C. Water supply for swimming areas
16. Where would the greatest amount of diversity of organisms occur?
- A. In the center of a pond
 - B. Next to concrete
 - C. Freshly plowed field
 - D. Near a stream with rocks, flowing water, & vegetation
17. In recent years, there have been numerous agencies planning manned trips to Mars. Why is traveling to Mars so difficult?
- A. Temperatures in space
 - B. Distance between planets
 - C. No landing runway on Mars
 - D. Erratic motion of planets
18. A non-native organism is introduced to a diverse climax community. If the non-native organism has no predators, what short term effect will non-native organism have on a community?
- A. The number of native organisms remain constant
 - B. The number of native organisms will decrease
 - C. The non-native organisms will become extinct
 - D. The non-native organisms will develop new predators
19. Which of the following is true about ecological succession?
- A. Succession leads to equilibrium in an ecosystem
 - B. Succession prevents ecosystems from reaching equilibrium
 - C. There is no relationship
 - D. Succession & equilibrium are the same thing

20. Based on the information below, which planet is the most likely to contain life?



Planet	Oxygen	Water
A	Yes	Yes
B	Yes	No
C	Yes	Yes
D	No	Yes

A. A

B. B

C. C

D. D

21. What type of dispersal is mostly likely used by this organism?

- A. Animal
- B. Wind
- C. Water
- D. Gravity



22. Blubber in arctic animals is an internal structural adaptation that allows animals to be successful in the environment. What function does blubber perform?

- A. It makes the animal look larger to intimidate predators
- B. Allows for better balance
- C. Provides more friction
- D. It protects the animal from freezing temperature





23. Which organism has small vacuoles?

- A. Plants
- B. Animals
- C. Virus

24. The cell wall is most similar to which body system?

- A. Nervous
- B. Digestive
- C. Respiratory
- D. Integumentary

25. Humans have selectively bred canines for specific jobs. Which dog is most likely to carry heavy weights in a cold environment?

A. 	B. 
C. 	D. 

26. Which of the following do rattlesnakes do when they feel threatened?

- A. Rattle their tail and hiss
- B. Make their hair stand up
- C. Close their eyes
- D. Slow their breathing

27. Which is not an example of heredity in humans?

- A. Height
- B. Eye color
- C. Spoken language
- D. Freckles

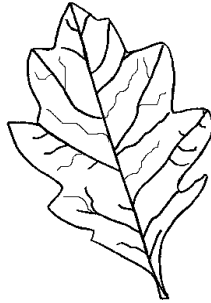
28. Which of the following is least likely to make an animal vomit?

- A. An infection in the stomach
- B. Consuming large amounts of water
- C. A toxin in the body
- D. Feeling cold after swimming in cold water

29. In sexual reproduction, how many genes does an offspring get for each trait?

- A. 0
- B. 1
- C. 2
- D. 4

30. Use the Dichotomous key to identify the leaf shown below:



1a	Leaf edge has no teeth, waves, or lobes	Go to 2
1b	Leaf edge has teeth, waves, or lobes	Go to 3
2a	Leaf has bristle at the tip	Shingle Oak
2b	Leaf has no bristles at the tip	Go to 4
3a	Leaf edge is toothed	Lombardy Poplar
3b	Leaf edge has waves or lobes	Go to 5
4a	Leaf is heart shaped	Red Bud
4b	Leaf is not heart shaped	Live Oak
5a	Leaf edge has lobes	English Oak
5b	Leaf edge has waves	Chestnut Oak

- A. Shingle oak
- B. Lombardy polar
- C. Red bud
- D. Live oak
- E. English oak

31. Which of the following is least likely to affect the phenotypes of an organism?

- A. Nucleus
- B. Vacuole
- C. Genes
- D. Chromosomes

32. Ovaries produce eggs and hormones. What body system does this best relate to?

- A. Integumentary
- B. Excretory and muscular
- C. Endocrine and reproductive
- D. Nervous and respiratory

33. Blood consists of red blood cells and white blood cells. Blood is mostly likely a

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

34. Based on the cell theory, what do the following organisms have in common?



- A. Reproduce spontaneously
- B. Cells are the basic unit of structure
- C. Organisms can photosynthesize
- D. Made of all the same atoms

35. Which activity would require the safety symbol for a sharp object?

- A. Determining the mass of a density cube
- B. Transferring a metal
- C. Making a model rocket
- D. Determining the volume of a liquid

**UNIVERSITY INTERSCHOLASTIC LEAGUE
2019-2020 SCIENCE I
SPRING TEST**

Answer Key

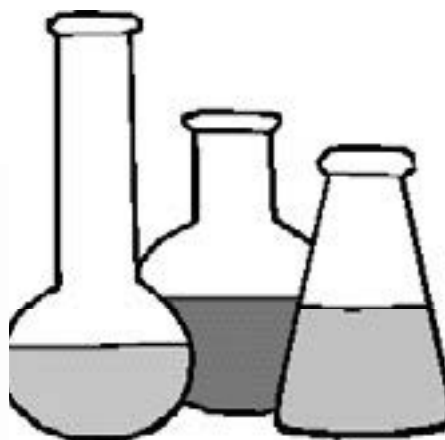
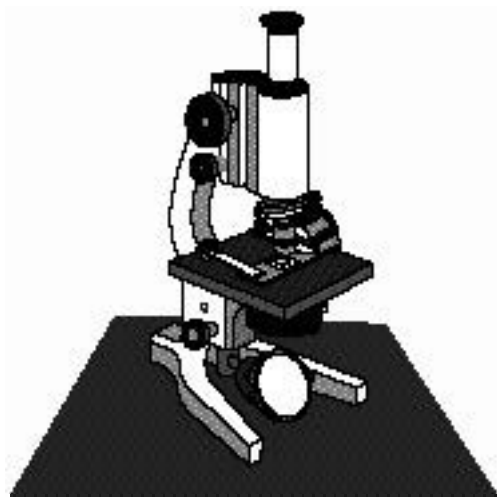
- | | |
|------|------|
| 1. C | 19.A |
| 2. B | 20.C |
| 3. D | 21.B |
| 4. A | 22.D |
| 5. B | 23.B |
| 6. C | 24.D |
| 7. A | 25.B |
| 8. C | 26.A |
| 9. D | 27.C |
| 10.B | 28.D |
| 11.C | 29.C |
| 12.B | 30.D |
| 13.A | 31.B |
| 14.C | 32.C |
| 15.A | 33.A |
| 16.D | 34.B |
| 17.B | 35.C |
| 18.B | |

SPRING DISTRICT 2019-2020

A+ ACADEMICS



University Interscholastic League



Science II

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

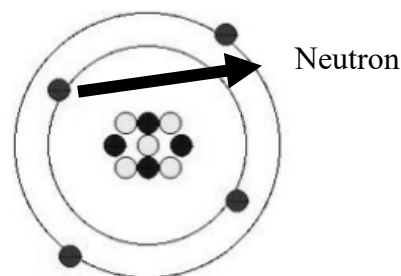
**UNIVERSITY INTERSCHOLASTIC LEAGUE
2019-2020 SCIENCE II
SPRING TEST**

1. Which activity would require the safety symbol for a sharp object?
A. Determining the mass of a density cube
B. Transferring a metal
C. Making a model rocket
D. Determining the volume of a liquid



2. A scientist is comparing the average snow fall in a year for New York City and Albany. Which graph is the best to use to represent this data?
A. Single line graph
B. Double line graph
C. Single bar graph
D. Double bar graph
3. Which best describes a proton?
A. No charge & the same mass as an electron
B. Positive charge & more mass than an electron
C. Positive charge & more mass than an neutron
D. Negative charge & same mass than an neutron
4. A boat is currently traveling forward, against the current of the river, at 8 m/s. Then the current slows from 2.5 m/s to 1.25 m/s; how does this affect the boat?
A. The boat will move more slowly
B. The boat will experience no change in motion
C. The boat will move faster
D. The boat comes to a complete stop

5. What element is represented in the illustration?
A. Li
B. Ne
C. Be
D. He



6. Which group is made from reactive metals?
A. 1
B. 7
C. 17
D. 18

7. What is the major difference between speed and velocity?
- A. Velocity is calculated as distance over time; speed is calculated as velocity over time
 - B. Velocity has a direction associated with it; speed has no direction associated with it
 - C. Speed has a direction associated with it; velocity has no direction associated with it
 - D. Speed is calculated as distance over time; velocity is calculated as speed over time

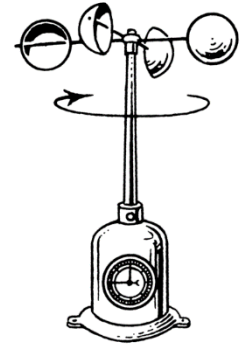
8. How many atoms of hydrogen are in glycine?



- A. 2 B. 5 C. 9 D. 10
9. A child collects rocks from the backyard. Which would be a chemical property of the rocks collected?
- A. Color of the rock
 - B. Texture
 - C. Bubbling when lemon juice is spilled on rock
 - D. The rock is easily scratched with sandpaper
10. Which of the following has the greatest mass?
- A. Solar system
 - B. Nebula
 - C. Galaxy
 - D. Planet
11. To calculate tidal force, which of the following statements is true?
- A. The moon's gravity pull in a specific location plus the moon's gravity pull in a specific location
 - B. The moon's gravity pull in a specific location minus the moon's gravity pull in a specific location
 - C. The moon's gravity pull in a specific location plus the moon's average gravitational pull over the entire earth
 - D. The moon's gravity pull in a specific location minus the moon's average gravitational pull over the entire earth
12. A rocket is launched to the moon. If no outside force is applied once the rocket reaches outer space, what happens to the speed as it travels in outer space?
- A. It will speed up
 - B. It will slow down
 - C. It will remain constant
 - D. It will fluctuate

13. If the earth's axis was not tilted in relation to its plane of orbit, which of the following would most likely occur?
- A. The equator would have two seasons
 - B. There would be no distinct seasons
 - C. Night in the northern hemisphere would be longer than the southern hemisphere
 - D. Summer in the northern hemisphere would be longer than the southern hemisphere
14. The Sun is to ___ as Mars is to Venus.
- A. Tau Ceti
 - B. Betelgeuse
 - C. Rigel
 - D. Sirius
15. How much of the lunar surface receives sunlight at one specific instant?
- A. One half
 - B. One third
 - C. One fourth
 - D. All of it
16. Using the electromagnetic spectrum, astronomers can determine all of the following characteristics of a distant star except which of the following?
- A. Its chemical composition
 - B. The organisms present
 - C. Its temperature
 - D. Its density
17. The plate tectonic theory can best explain which of the following?
- A. Earthquakes
 - B. Mountain construction
 - C. Volcanic activity
 - D. Fossil record
18. Which of the following best supports the Big Bang Theory?
- A. Various shapes of galaxies
 - B. Speed of light
 - C. Red & blue shifts of light from stars
 - D. The motion of planets in orbit
19. Scientists observe that when continental plates & oceanic plates collide, the oceanic plate is forced below the continental plate. This might be because –
- A. The different densities of the plates
 - B. The different masses of the plates
 - C. Convection current
 - D. The width of the plates
20. A student reads a topographic map and determines the highest elevation to be 1800 meters and the lowest elevation to be 1120 meters. Based on this information, what is the difference between these elevations?
- A. 2920 m
 - B. 680 m
 - C. 340 m
 - D. 1800 m

21. How would the motion of an anemometer be changed if the amount of radiant energy that reached the Earth's atmosphere was to increase?



- A. It would spin in the opposite direction
- B. It would spin faster
- C. It would spin slower
- D. It would remain constant

22. Which of the following is an adaptation for plants in a rainforest that need to obtain sunlight in order to photosynthesize?

- A. Vines wrapping around tree trunks
- B. Vibrant colored flowers
- C. Shallow root system
- D. Small leaves

23. This type of weather front usually brings a decrease in temperature, clearing skies, & a sharp change in the wind direction. Which of the following best describes this scenario?

- A. Directional front
- B. Stationary front
- C. Warm front
- D. Cold front

24. La Niña represents periods of below average sea surface temperatures across the equatorial Pacific Ocean. What is most likely to occur due to these specific conditions?

- A. Wetter than average conditions in the U.S. gulf coast
- B. Increase in severe storms originating in the Pacific Ocean
- C. Decrease in hurricanes originating in the Pacific Ocean
- D. Colder temperatures in the winter for the southeast

25. A force acts on a soccer ball for four seconds causing it to accelerate. If the ball is replaced with a similar ball with twice the mass and the same force is applied for the same amount of time, the acceleration of the similar ball will now be –



- A. One half the value
- B. The same value
- C. Twice the value
- D. Four times the value

26. Which tool would be used to determine elements that are present in stars in a distant galaxy?

- A. Telescope
- B. Spectroscope
- C. Microscope
- D. Psychrometer

27. It has been suggested that student misbehaviors are more common during a full moon compared to other times of the month. What could be done to test this hypothesis?



- A. Observe student behavior during a full moon and create categories for behaviors
- B. Create a survey
- C. Ask students when they misbehave the most
- D. Look at discipline records from previous years & compare with time of full moon

28. If a lab requires that students have goggles, a graduated cylinder, and a thermometer; what task might they be performing?

- A. Calculating density
- B. Measuring volume & temperature of a liquid
- C. Measuring mass & temperature of a solid
- D. Determining the meniscus

29. In a mountain range there is a point called a tree line, in which trees do not normally grow near the top of the mountain. What environmental condition would most likely prevent trees from growing in this area?

- A. No oxygen is present
- B. The air pressure is too high
- C. The temperature is too low
- D. There is no sunlight



30. Which of the following would you not do to minimize the impact of human activities on the world?

- A. Reusing items
- B. Renovate all housing on a university campus
- C. Recycle
- D. Reduce consumption

31. Which of the following is an alkaline earth metal?

- A. Potassium
- B. Barium
- C. Aluminum
- D. Silver



32. When did Newton first propose his Laws of Motion?
- A. During World War I
 - B. After the Civil War
 - C. Approximately 300 years ago
 - D. After humans orbited the Earth
33. A student uses a warped meter stick to take measurements in an experiment. Which of the following occurred when the student introduced the warped meter stick into the experiment?
- A. Method error
 - B. Instrumental error
 - C. Human error
 - D. Estimation error
34. Light from moving objects will appear to have different wavelengths depending on the relative motion of the source and the observer. An astronomer discovers two stars, Star A and Star B. Both stars appear to be red, but Star A appears to be a darker red. Which of the following can be concluded?
- A. Star A is moving towards the Earth
 - B. Star A is moving away from Earth faster than Star B
 - C. Star B is moving away from Earth and Star A is moving towards it
 - D. Both Star A and B are moving towards Earth at similar velocities
35. Each of these is an example of how research has changed scientific understanding except:
- A. Classification of living things now includes six kingdoms instead of five
 - B. Protons and electrons are now known to be made of smaller particles of matter
 - C. The metric system is now used around the world instead of other less precise systems
 - D. Heat, which was once thought to be fluid, now is known as a form of energy.

**UNIVERSITY INTERSCHOLASTIC LEAGUE
2019-2020 SCIENCE II
SPRING TEST**

Answer Key

- | | |
|------|------|
| 1. C | 19.A |
| 2. B | 20.B |
| 3. B | 21.B |
| 4. C | 22.A |
| 5. C | 23.D |
| 6. A | 24.C |
| 7. B | 25.A |
| 8. B | 26.B |
| 9. C | 27.D |
| 10.C | 28.B |
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| 15.A | 33.B |
| 16.B | 34.B |
| 17.D | 35.C |
| 18.C | |