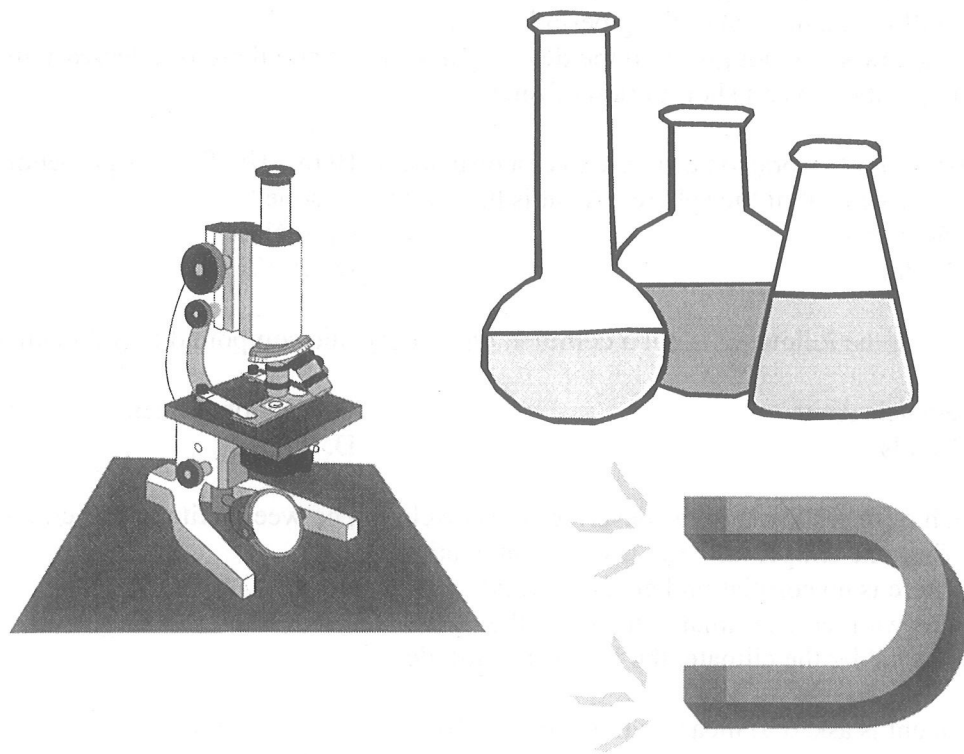


INVITATIONAL 2012-2013

A+ ACADEMICS



University Interscholastic League

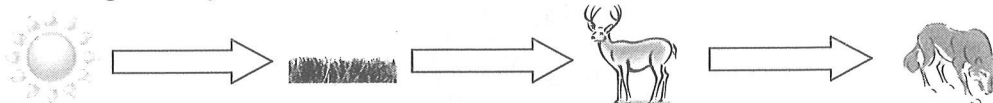


Science I

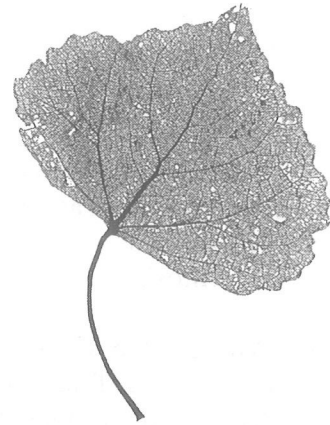
**DO NOT OPEN TEST
UNTIL TOLD TO DO SO**

UNIVERSITY INTERSCHOLASTIC LEAGUE
2012-2013 SCIENCE I
INVITATIONAL TEST

1. A simple food chain is shown below. If there is an extreme drought, which of the following is likely to occur?



- A. The grass will not grow, so the deer begin to starve and there is an increase in the wolf population over a short period of time.
- B. The grass will not grow, so the deer begin to starve and there is a decrease in the wolf population over a long period of time.
- C. The grass will not grow, so the deer begin to starve and there is an increase in the wolf population over a long period of time.
- D. The grass will not grow, so the deer begin to starve and there is a decrease in the wolf population over a short period of time.
2. A force of 5 N works on a sphere over a distance of 10 m. The force is perpendicular to the displacement of the sphere. What is the total work done?
- A. 50 N x m
B. 2 N/m
C. 0 N x m
D. .5 N/m
3. Which of the following is not a common type of organic compound found in an animal cell?
- A. Nucleic Acid
B. Lipids
C. Carbohydrates
D. Water
4. Which of the following best describes the correlation between latitude and climate?
- A. Extreme temperature ranges occur at a latitude of 0°
B. There is no correlation between latitude and climate
C. The warmer the climate, the lower the latitude
D. The colder the climate, the lower the latitude
5. A student is asked to measure the density of bromine at room temperature. Which of the following sets of equipment would be most appropriate?
- A. Thermometer and ruler
B. Ruler and balance
C. Beaker and thermometer
D. Graduated cylinder and balance



6. Use the dichotomous key to identify the type of leaf pictured.

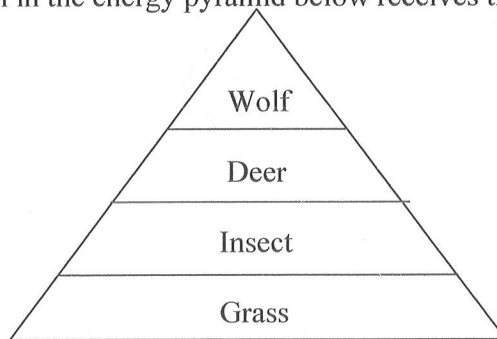
1. Leaves are needlelike or very small and scalelike.	Go to 2.
1. Leaves are broad.	Go to 5.
2. Leaves are long and needlelike.	Go to 3.
2. Leaves are small and scalelike.	CEDAR
3. Two needles to a bundle.	SHORTLEAF
3. Three needles to a bundle.	Go to 4.
4. Adult needles are 4-6 inches.	LOBLOLLY
4. Adult needles are 6-12.	LONGLEAF PINE
5. Leaves are broad and heart shaped.	Go to 6.
5. Leaves are not heart shaped.	Go to 7.
6. Leaf edge is saw toothed.	COTTONWOOD
6. Leaf edge is smooth.	REDBUD
7. Leaves grow oppositely of branch.	Go to 8.
7. Leaves grow alternately.	Go to 11.
8. Leaves are simple and lobed.	Go to 9.
8. Leaves are simple and not lobed.	Go to 10.
9. Leaves are moderately lobed.	RED MAPLE
9. Leaves are deeply lobed (almost to the mid-rib).	SILVER MAPLE

- A. Cedar
B. Loblolly

- C. Cottonwood
D. Silver Maple

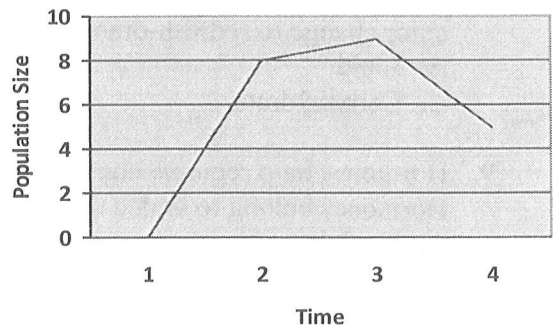
7. In a sea sponge, part of the sponge falls off and starts to grow into a new sponge. This is an example of which type of reproduction?
 A. Fragmentation
 B. Binary fission
 C. Sexual reproduction
 D. Budding
8. A student adds several drops of Benedict's solution to a small amount of pudding mix that is combined with distilled water. The solution is then heated. Observations include a color change to reddish-orange. This test indicates that the pudding most likely contains:
 A. Lipid
 B. Carbohydrate
 C. Protein
 D. Nucleic Acid
9. Hormones help regulate numerous functions and processes in the human body. Hormones belong to which of the following?
 A. Nucleic Acids
 B. Polysaccharide
 C. Amino Acids
 D. Proteins

10. A litter of puppies can vary in color. The color and patterns of each are distinct from its parents as well as its siblings. What process is responsible for these differences?
- A. Meiosis
B. Mitosis
C. Replication
D. Translation
11. Which of the following would best describe how an organism would maintain homeostasis if the amount of CO₂ in their body was to increase?
- A. The blood supply to muscles decreases
B. Higher levels of insulin are secreted
C. Perspiration occurs
D. To increase gas exchange, lung activity is increased
12. Each spring, there are normally strong thunderstorms that help create temporary ponds in low lying areas. The pond may last for several weeks, and during this time mosquitoes use the pond to reproduce. During hurricane season, a hurricane drops torrential amounts of rain on this area. How would this most likely affect the population living in this ecosystem?
- A. The population of the mosquitoes would decrease
B. The population of the mosquitoes would increase
C. The population of the mosquitoes would remain constant
D. The population of the mosquitoes would decrease and then level off
13. Which organism in the energy pyramid below receives the least amount of energy?



- A. Grass
B. Deer
C. Wolf
D. Insect
14. According to the graph below, when was an introduction of a competitor most likely to have occurred?

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



15. When a haploid cell combines with another haploid cell to form a diploid cell. Which process best describes what is taking place?

- A. Cloning
- B. Mitosis
- C. Asexual reproduction
- D. Sexual reproduction

16. Which of the following Punnett squares is correctly set up for parents that are heterozygous for tongue rolling?

A.

RR	RR
Rr	Rr

C.

RR	rr
rr	Rr

B.

RR	Rr
Rr	rr

D.

rr	RR
RR	Rr

17. Which of the following would be considered a limitation of a model of the solar system?

- A. Size of the stars
- B. Size of the celestial bodies
- C. Distances between the planets
- D. Number of celestial bodies

18. Which of the following organelles modifies cellular products and packages the products for distribution in the cell?

- A. Ribosome
- B. Cell membrane
- C. Mitochondria
- D. Golgi apparatus

19. Which of the following processes do cells use to absorb, release, and use energy:

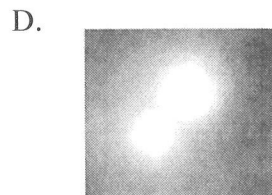
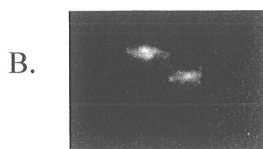
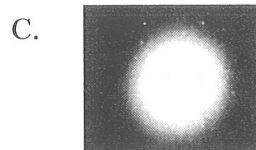
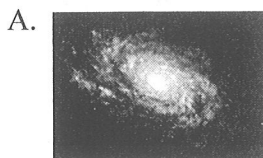
- A. Respiration and fermentation
- B. Digestion and photosynthesis
- C. Photosynthesis and respiration
- D. Mitosis and respiration

20. Which environment would the following animal live in based on these characteristics?

Long slender body
Long Tail
Webbed feet with claws
Scales
Snout with nostrils

- A. Tundra
- B. Marsh
- C. Forest
- D. Savanna

21. Scientists want to determine how closely related two types of squirrels are that live on opposite sides of the Grand Canyon. Which would be the most accurate to use as a comparison?
- A. Their niches
 B. Behavioral characteristics
 C. Physical characteristics
 D. DNA sequence
22. A person observes a very bright celestial body in the night sky and hypothesizes that it could be the planet, Venus. Which observation would best help to support this?
- A. After a few seconds, its position in relation to the surrounding stars has changed
 B. After a few minutes, its position in relation to the surrounding stars has changed
 C. After an hour, its brightness has increased
 D. After a month, its position in relation to the surrounding stars has changed
23. A student at rest in a chair has a force that is exerted on the chair. How does that force compare to the force that the chair exerts on the student?
- A. Same magnitude and same direction
 B. Same magnitude but opposite direction
 C. Larger magnitude and same direction
 D. Larger magnitude but opposite direction
24. What is the approximate percentage of the Earth that is illuminated by the sun at a given moment?
- A. 50 %
 B. 25 %
 C. 75 %
 D. 10 %
25. A student goes on spring break to an area near a volcano that recently erupted. The student can expect which of the following?
- A. Non- foliated metamorphic rock
 B. Sedimentary rock
 C. Extrusive igneous rock
 D. Foliated metamorphic rock
26. Which of the following galaxies best represents the Milky Way Galaxy?



27. Qualitative results can refer to which of the following?
- A. Results that are observed during an experiment
 - B. Results that are impossible to observe in an experiment
 - C. Numerical data
 - D. None of these

28. How many kilograms are there in 4.25 pounds? (2.2 lbs = 1 kg)
- A. 9.26 kg
 - B. 1.93 kg
 - C. 9.35 kg
 - D. .52 kg

29.



Fig 1

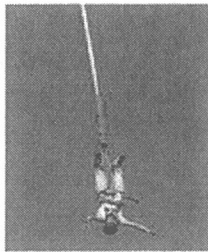


Fig 2



Fig 3

- Which of the following kinds of energy is represented by the figures one and two shown above?
- A. Gravitational Potential Energy
 - B. Elastic Potential Energy
 - C. Thermal Energy
 - D. Chemical Potential Energy
30. In an experiment there are two marbles, one glass and one steel. The marbles are the same size. The glass marble is gently placed into a graduated cylinder and it sinks to the bottom and the water level rises to the 5th mark above the initial volume of the water. If the steel marble is put into a graduated cylinder with the same initial volume as that of the glass marble, the water for the steel marble will:
- A. Be the same level as it was in cylinder 1
 - B. Be at a lower level than cylinder 1
 - C. Be at a higher level than cylinder 1
31. What type of instrument would best allow a scientist to study the events that lead up to the separation of chromosomes during mitosis?
- A. Transmission electron microscope
 - B. Compound light microscope
 - C. Scanning electron microscope
 - D. Long range telescope
32. When gathering glassware and equipment for a laboratory activity:
- A. Read all directions carefully to determine the equipment that is necessary
 - B. Examine all glassware carefully
 - C. Clean any glassware that appears contaminated
 - D. None of the above
 - E. All of the above

33. Why is it imperative that hot glassware is not immersed in cold water:
- A. The glassware could undergo a chemical reaction
 - B. The glassware could undergo a physical state change
 - C. The temperature of the water will become exponentially hot
 - D. The glassware could shatter
34. By performing a dissection and analysis of an object's light, astronomers can infer the physical properties of celestial bodies. Which device would best help scientists study this?
- A. Telescope
 - B. Microscope
 - C. Spectroscope
 - D. Binoculars
35. A student has lab calculated the acceleration of a toy car. Remember that acceleration is rate of change in velocity of an object over time. Which set of units would best represent the proper SI units for acceleration?
- A. cm/L
 - B. m/s^2
 - C. k/hr
 - D. mph