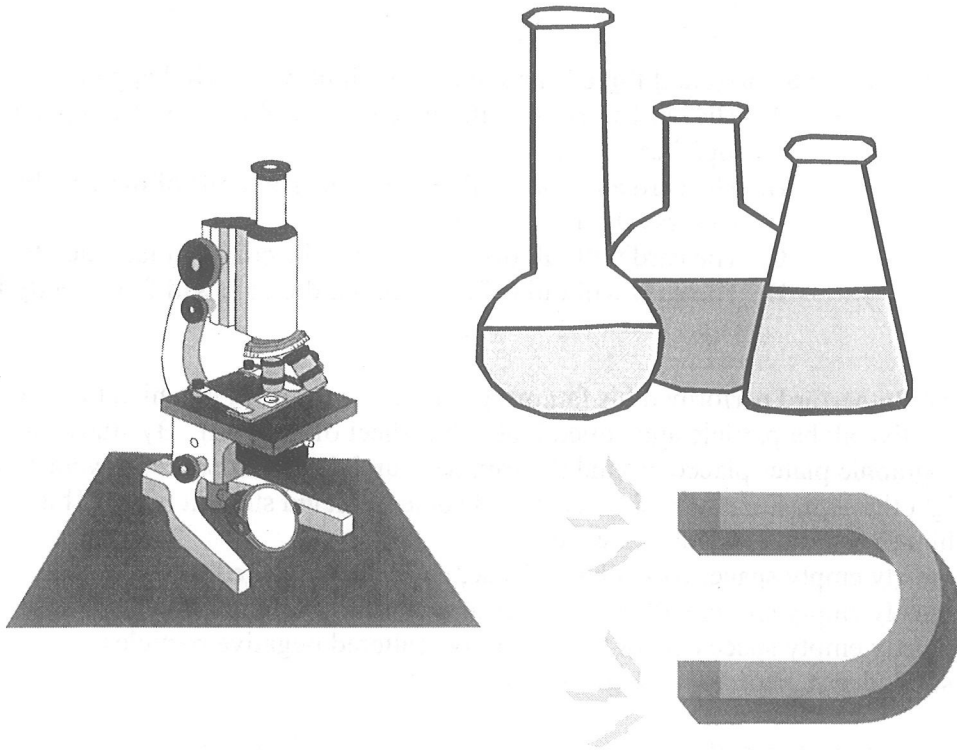


**FALL/WINTER DISTRICT 2012-2013**

**A+ ACADEMICS**



University Interscholastic League

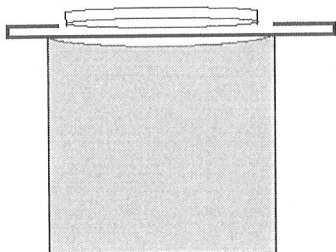


# Science II

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

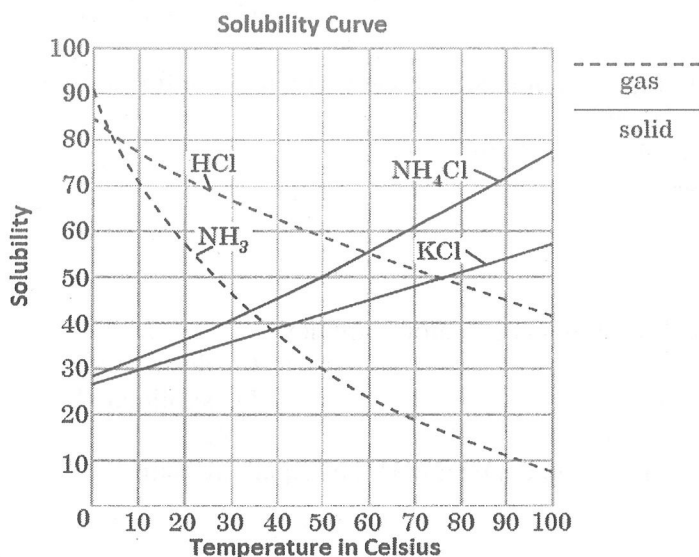
UNIVERSITY INTERSCHOLASTIC LEAGUE  
2012-2013 SCIENCE II  
FALL/WINTER DISTRICT TEST

- Which of the following is NOT a way for humans to reduce their dependence on natural resources?  
A. Conserving water  
B. Recycle paper products  
C. Turn off lights when not in use  
D. Set air conditioner a few degrees lower
- A car accelerates uniformly at a rate of  $1.5 \text{ m/s}^2$ . How long will it take the car to reach a speed of  $40 \text{ m/s}$ ?  
A. 41.5 s  
B. 60 s  
C. 26.7 s  
D. 0.04 s
- A coin is placed on top of an index card, as shown below, which was placed on top of a cup.



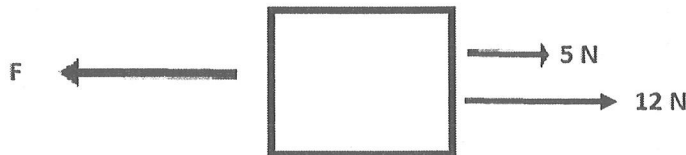
- When a horizontal force is applied to the right, what will happen?
- The card and coin will move to the right, off of the cup, and land together.
  - The card and coin will move to the right, off of the cup, but the coin will travel farther.
  - The card will fall off the cup, but the coin will fall back to the left.
  - The card will fall off the cup, but the coin will fall directly into the cup.
- Ernest Rutherford performed his famous gold foil experiment, in which he used a radioactive alpha particle and aimed it at a thin sheet of gold foil. By studying the photographic plates placed around the foil, he found that most particles were able to pass straight through, some were deflected, and some reflected straight back. This discovery led him to conclude that atoms were  
A. mostly empty space, with a large dense, negatively charged center.  
B. mostly empty space, with a small dense, positively charged center.  
C. mostly empty space except for randomly scattered negative particles.  
D. solid, dense, neutrally charged particles.
  - How are the isotopes of Oxygen – 15 and Oxygen – 16 different?  
A. Number of protons  
B. Number of electrons  
C. Number of neutrons  
D. Atomic number
  - The reaction of Sodium Hydroxide and water is exothermic. A student mixes the two in a test tube and touches the side of the test tube. Which of the following best describes the observation the student should have witnessed?  
A. Test tube was hot as heat was released.  
B. Test tube was hot as heat was absorbed.  
C. Test tube was cold as heat was released.  
D. Test tube was cold as heat was absorbed.

7. Using the graph below, determine which substance was affected the most by the change in temperature.



- A. HCl                                      B. NH<sub>3</sub>                                      C. NH<sub>4</sub>Cl                                      D. KCl
8. In general, what causes currents in Earth's atmosphere?  
 A. Ocean waves  
 B. Atmospheric pressure  
 C. Warm air rising and cold air sinking  
 D. Solar radiation in the upper atmosphere
9. Which of the following properties of matter would remain the same during both a physical and chemical change?  
 A. Density                                      C. Size  
 B. State of Matter                                      D. Mass
10. Which of the following statements best describes the length of time it takes for the Earth to revolve once around the sun?  
 A. One complete moon cycle                                      C. Six moon cycles  
 B. Three moon cycles                                      D. Twelve complete moon cycles
11. The Andromeda galaxy, unlike most other galaxies in the universe, has been observed with a blue shift. What does this mean?  
 A. Movement of the source toward the observer  
 B. Movement of the source away from the observer  
 C. The source is not moving
12. If an atom has an amu of 30 and it has 13 electrons, what is its atomic number?  
 A. 13                                      B. 17                                      C. 43                                      D. 390

13. You travel by bus for one hour and go 65 miles. 65 mph would describe your  
 A. average speed. C. momentum.  
 B. average velocity. D. acceleration.
14. By studying starlight, astronomers may learn which of the following?  
 A. Elemental composition  
 B. Speed of a star relative to Earth  
 C. Surface temperature  
 D. All of these  
 E. None of these
15. When any chemical reaction occurs, atoms are never \_\_\_\_\_.  
 A. ionized C. destroyed  
 B. rearranged D. sublimated
16. These lines on a weather map connect points of equal pressure.  
 A. Isobars  
 B. Isotherms  
 C. High  
 D. Low
17. Which of the following is equivalent to  $6.85 \times 10^4$  m?  
 A. 6850000 m C. 6850 m  
 B. 68500 m D. 0.00685 m
18. A group of students measures the displacement of a toy car. Which of the following tools is needed to collect this data?  
 A. Balance C. Meter Stick  
 B. Graduated Cylinder D. Spring Scale
19. The earthquake that occurred in 2011 off Japan's coast caused the Earth to move about 6.5 inches. Which of the following could be a consequence?  
 A. Changes in the length of a day  
 B. Changes in the order of the seasons  
 C. Changes in the lunar cycle  
 D. A decrease in the number of earthquakes
20. The diagram below shows three horizontal forces acting on the box. Neglecting all sources of friction, what is the magnitude of the force, F, if the object remains at rest?

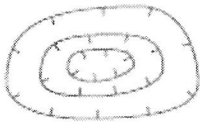


- A. 20 N B. 7 N C. 12 N D. 17N

21. A student does an experiment to measure the acceleration of falling bodies, which is  $9.8 \text{ m/s}^2$ . The student collects an experimental value of  $12.8 \text{ m/s}^2$ . The most likely reason for the discrepancy is due to
- A. air friction.
  - B. human error.
  - C. mass of the object.
  - D. potential energy of the object.
22. An astronaut of the moon would not be able to hear a landslide because
- A. the magnetic field of the moon is too strong to transmit sounds.
  - B. cosmic radiation destroys the transmission of sound waves.
  - C. lunar rocks absorb the sound.
  - D. any air molecules present on the moon are too far apart to transmit the sound.
23. Which of the following resources would give the most current, complete and accurate information regarding the planets?
- A. Google Web Search
  - B. A science magazine
  - C. A set of encyclopedias
  - D. NASA Website
24. In a lab, students are looking at an aquatic terrarium containing several live animals. In the directions, the students notice a safety symbol that contains a mouse, indicating that biological specimens will be present in the lab. Who does this precaution protect?
- A. The students in the lab
  - B. The instructor
  - C. Both the aquatic specimens and the students
  - D. The aquatic specimens
25. A simile is a device used for comparison in literature. What factor in an experiment is most like a simile?
- A. Dependent variable
  - B. Independent variable
  - C. Constant
  - D. Control
26. A plant is located on the banks of a river. One day, by accident, toxic chemicals from the facility spilled into the river. Fish absorbed some of the chemicals into their bodies. Later, an owl living near the water was found to have the same chemicals in its body. Which statement best explains this?
- A. The chemicals became airborne and were absorbed through respiration of the animals.
  - B. The chemicals entered the food chain.
  - C. The chemicals were contagious and spread like a disease.
  - D. The chemicals are commonly found in the environment.
27. Calcium chloride is a substance that can be used on the roads to melt ice and snow in the winter. Its formula contains one calcium ion for every two chloride ions. What type of matter is calcium chloride classified as?
- A. Ionic compound
  - B. Element
  - C. Covalent compound
  - D. Heterogeneous mixture

28. What does the plate tectonic theory predict about the distribution of volcanic and earthquake activities?
- A. Activities should be evenly distributed throughout the planet.
  - B. Activities should occur primarily along plate boundaries.
  - C. Activities should occur primarily on the continents.
  - D. Activities should occur on a regular basis.

29. The symbol shown below would represent which of the following on a topographic map?



- A. An area that is depressed
  - B. An area that is raised
  - C. An area that is covered with water
30. Another form of interdependence between organisms is called symbiosis. There are several types of symbiosis. The difference between each type is determined by how beneficial, or harmful, the relationship is to the organisms. When one organism benefits and the other one remains constant, or neutral, this is called
- A. mutualism.
  - B. commensalism.
  - C. colonialism.
  - D. amensalism.
31. An organism, such as an owl, would be expected to have which of the following evidences to show that it is a nocturnal creature?
- A. Sharp talons
  - B. Defensive shape of beak
  - C. Large eyes
  - D. Thick feathers
32. An individual has an idea for a new pest control for farmers and ranchers. The individual makes a prototype of the product and begins to sell the product. Which step has this individual neglected to follow?
- A. Identify the problem
  - B. Form a hypothesis
  - C. Test the product
  - D. Verify the results of the product
33. Only ten percent of energy stored in an organism is passed on to the next higher trophic level. Of the remaining energy, some is used for life processes, and the rest is
- A. used in reproduction.
  - B. stored in lipids.
  - C. stored in muscles.
  - D. eliminated as thermal energy.
34. Which of the following would most likely result from a collision between a continental lithospheric plate and an oceanic lithospheric plate?
- A. Volcanic island arc
  - B. Chain of coastal volcanic mountains
  - C. Mid-oceanic ridge
35. The distance from the ocean and the water currents can affect all of the following except
- A. temperature.
  - B. wind speed.
  - C. seasons.
  - D. amount of precipitation.