

## What students might read in high school science.

On the actual Chemistry Test, the following type of question must be answered on a special section (labeled "Chemistry") at the lower left-hand corner of your answer sheet. These questions will be numbered beginning with 101 and must be answered according to the following directions.

### Sample Answer Grid

\*Fill in circle CE (correct explanation) only if statement II is a correct explanation of the true statement I.

	I	II	CE*
101	<input type="radio"/> T <input type="radio"/> F	<input type="radio"/> T <input type="radio"/> F	<input type="radio"/> CE

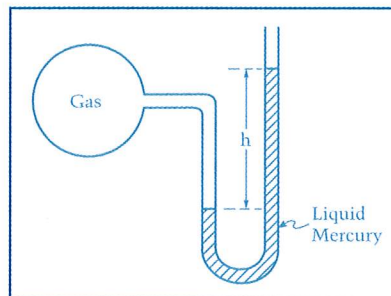
**Directions:** Each question below consists of two statements, I in the left-hand column and II in the right-hand column. For each question, determine whether statement I is true or false and whether statement II is true or false and fill in the corresponding T or F circles on your answer sheet. \*Fill in circle CE only if statement II is a correct explanation of the true statement I.

I	BECAUSE	II
101. The rate at which sugar dissolves in water increases with stirring		stirring exposes the surface of a solute crystal to a less concentrated layer of solution.
102. Diamond has a high melting point		in a diamond crystal, the carbon atoms are held in place by ionic bonds.
103. Potassium has a lower first ionization energy than lithium has		potassium has more protons in its nucleus than lithium has.
104. Zinc metal will reduce $\text{Cu}^{2+}$ in solution		zinc is a more active metal than copper is.
$\text{HC}_2\text{H}_3\text{O}_2 + \text{H}_2\text{O} \rightleftharpoons \text{C}_2\text{H}_3\text{O}_2^- + \text{H}_3\text{O}^+$		
105. If some acetic acid, $\text{HC}_2\text{H}_3\text{O}_2$ , is added to the equilibrium mixture represented by the equation above, the concentration of $\text{H}_3\text{O}^+$ decreases		the equilibrium constant of a reaction changes as the concentration of the reactants changes.

On the actual Chemistry Test, the remaining questions must be answered by returning to the section of your answer sheet you started for the Chemistry Test.

**Directions:** Each of the questions or incomplete statements below is followed by five suggested answers or completions. Select the one that is best in each case and then fill in the corresponding circle on the answer sheet.

11. The hydrogen ion concentration of a solution prepared by diluting 50. mL of 0.10 M  $\text{HNO}_3(aq)$  with water to 500. mL of solution is  
 (A) 0.0010 M (B) 0.0050 M (C) 0.010 M  
 (D) 0.050 M (E) 1.0 M
- ...  $\text{Cu}^{2+}(aq) + \dots \text{I}^-(aq) \rightarrow \dots \text{CuI}(s) + \dots \text{I}_2(s)$
12. When the equation above is balanced and all coefficients are reduced to lowest whole-number terms, the coefficient for  $\text{I}^-(aq)$  is  
 (A) 1 (B) 2 (C) 3  
 (D) 4 (E) 5



13. The bulb of the open-end manometer shown above contains a gas. True statements about this system include which of the following?
- I. Only atmospheric pressure is exerted on the exposed mercury surface in the right side of the tube.
  - II. The gas pressure is greater than atmospheric pressure.
  - III. The difference in the height,  $h$ , of mercury levels is equal to the pressure of the gas.
- (A) II only  
 (B) III only  
 (C) I and II only  
 (D) I and III only  
 (E) I, II, and III