

## CHEMISTRY.

(Covering first half year of high school work, answer any five.)

1. Distinguish between physical and chemical changes. Give three illustrations of each occurring in everyday life. What often accompanies chemical change?

2. Give the three essential characteristics of chemical compounds. Is air a mixture or a chemical compound? Give three reasons for your answer.

3. Make clear by examples what is meant by the Law of Multiple Proportion. Show how Avogadro's Law may be used for the determination of molecular weights.

4. If 500 c.c. of gas at  $27^{\circ}$  C are cooled to  $-50^{\circ}$  C, what is the new volume? State and interpret the law involved.

5. What quantity of what materials would be used in preparing 10 litres of chlorine?

6. Define and illustrate (a) percentage composition, (b) simple formula.

(Covering the second half-year of high school work, answer any five.)

7. Define the terms: oxidation, reduction, electrolysis, electrolyte, ionization. What application is made of the Theory of Ionization?

8. Develop the topics: valence, nascent state, chlorine as an oxidizing agent.

9. Name and give formulæ of two useful salts of each of the following metals: potassium, copper, mercury, aluminum.

10. Describe fully the action of carbon dioxide on lime-water. Give equations for the reaction.

11. Discuss the manufacture of cast iron, steel, wrought iron.

12. Define: (a) metal and non-metal, (b) metallurgy. What general operation does it include?