CHEMISTRY.—Optional.

Thursday, June 2nd :—Morning, 9 to 10.30.

Answer two questions from each group.

I.

1. Explain the distinction between elements and compounds. What is meant by the statement that the elements combine in definite weights?

2. How may Nitrogen be obtained from the air? What are its properties?

3. What takes place (*a*) when a piece of Sodium is thrown upon water, and (*b*) when steam is passed over heated iron?

II.

1. What gas is evolved when Sal Ammoniac and Quicklime are mixed together? Describe its properties.

2. How would you determine the proportions by weight of Oxygen and Hydrogen in Water? Give a sketch of the apparatus that you would employ.

3. What takes place when an acid and a base are brought together? Illustrate by means of two equations.

III.

1. What solvents would you employ if you wished to dissolve (1) Silver, (2) Gold, (3) Iodine, (4) Sulphur?

2. How is Crude Petroleum treated in order to obtain from it an oil fit for household use?

3. Express by means of equations the chemical changes that take place (*a*) when Copper and Sulphuric Acid are heated together, (*b*) when Iron Sulphide is treated with dilute Sulphuric Acid.

PHYSICS.—Optional.

Thursday, June 2nd:—Morning, 10.30 to 12.

1. Explain carefully how a mercury barometer is made, and how it measures the atmospheric pressure.

If mercury and sulphuric acid are 13.6 and 1.84 times as heavy as water respectively, what height would a sulphuric acid barometer stand at, when the mercury barometer indicated 30 inches?