Your responses to the rest of the questions in this part of the examination will be graded on the basis of the accuracy and relevance of the information cited. Explanations should be clear and well organized. Examples and equations may be included in your responses where appropriate. Specific answers are preferable to broad, diffuse responses.

Answer BOTH Question 5 below AND Question 6 printed on page 12. Both of these questions will be graded. The Section II score weighting for these questions is 30 percent (15 percent each).

5. Answer the following questions that relate to laboratory observations and procedures.

   (a) An unknown gas is one of three possible gases: nitrogen, hydrogen, or oxygen. For each of the three possibilities, describe the result expected when the gas is tested using a glowing splint (a wooden stick with one end that has been ignited and extinguished, but still contains hot, glowing, partially burned wood).

   (b) The following three mixtures have been prepared: CaO plus water, $SiO_2$ plus water, and $CO_2$ plus water. For each mixture, predict whether the pH is less than 7, equal to 7, or greater than 7. Justify your answers.

   (c) Each of three beakers contains a 0.1 *M* solution of one of the following solutes: potassium chloride, silver nitrate, or sodium sulfide. The three beakers are labeled randomly as solution 1, solution 2, and solution 3. Shown below is a partially completed table of observations made of the results of combining small amounts of different pairs of the solutions.

| | Solution 1 | Solution 2 | Solution 3 |
|---|---|---|---|
| Solution 1 | | black precipitate | |
| Solution 2 | | | no reaction |
| Solution 3 | | | |

   (i) Write the chemical formula of the black precipitate.

   (ii) Describe the expected results of mixing solution 1 with solution 3.

   (iii) Identify each of the solutions 1, 2, and 3.



GO ON TO THE NEXT PAGE.