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| **WASHINGTON LATIN PUBLIC CHARTER SCHOOL**  **CHEMISTRY 2019-20**    **UNIT 5A – CHEMICAL REACTIONS I – ACIDS AND BASES**  **TEST**  Answer all questions  Recommended time = 50 minutes  BAHATI NJEMA!     |  |  |  |  | | --- | --- | --- | --- | |  | Name: |  |  | |  | Score for Q1 - 3 (open response) | /25 |  | |  | Score for Q4 - 10  (multiple choice) | /8 |  | |  | Bonus  (Submits quiz on time and in correct format) | /7 |  | |

**SECTION A – OPEN RESPONSE**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **1.** | Neutralization reactions are reactions between acids and bases to produce salts. They have a variety of uses, including making different salts.  Complete the following table to show the names and formulas of different acids, bases and salts. | | | |  |
| name | | Formula | acid, base or salt? | 5 |
|  | | KOH | base |
| potassium nitrate | |  |  |
|  | | HNO3 |  |
| magnesium carbonate | | MgCO3 |  |
| magnesium chloride | |  |  |
|  | | HCl |  |
| (a) | Complete the following symbol equations for neutralization reactions: | | |  |
|  | (i) | KOH + HNO3 → | | 4 |
| (ii) | MgCO3 + 2HCl → | |
| (b) | State what you would see as reaction (a) (ii) was taking place | | | 2 |
|  | | |
| TOTAL | | | | 11 |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **2.** | The acidity or alkalinity of a solution can be captured in a single number, called the pH.    The acidity or alkalinity of a solution can also be determined by using acid-base indicators. Two common indicators are methyl orange and phenolphthalein. The colors and end-point pH ranges of these indicators are shown in the table below:      A sample of lemon juice was analysed and found to have a pH of 3  A sample of blood was analysed and found to have a pH of 7  A sample of 0.1 mol/L sodium hydroxide was also analysed    Complete the following table: | | | | |  |
| Sample | pH | acidic, neutral or alkaline? | Color it turns bromothymol blue | Color it turns phenolphthalein |
| Lemon juice | 13 |  |  |  |
| Blood | 5 |  |  |  |
| Hydrochloric acid |  |  |  |  |
| TOTAL | | | | | 5 |

|  |  |  |  |
| --- | --- | --- | --- |
| **3.** | Lactic acid, HC3H5O3, is a weak acid.  Xondra had a solution of lactic acid of unknown molarity.  She determined the molarity of the lactic acid solution by carrying out a titration with 0.10 mol/L sodium hydroxide solution using phenolphthalein indicator.  She found that 21.5 mL of the lactic acid solution were required to react with 25 mL of the sodium hydroxide solution. | |  |
| (a) | Describe in detail how Xondra would perform the titration. Include the names of any equipment used. | 4 |
|  |  |
| (b) | Calculate the molarity of the lactic acid solution.  Use the formula. | 3 |
|  |  |
| (c) | Describe the change in color Xondra would see when the lactic acid had been completely neutralized. | 2 |
|  |  |
| TOTAL | | 9 |

**SECTION B – MULTIPLE CHOICE**

**Do not answer these questions on this document. Click on the answer sheet provided at the end of the questions.**

|  |  |  |
| --- | --- | --- |
| **4.** | When copper oxide reacts with sulfuric acid, the name of the salt produced is | |
|  | A | copper acid |
|  | B | copper sulfate |
|  | C | sulfuric oxide |
|  | D | sodium chloride |
| 2 | | |

|  |  |  |
| --- | --- | --- |
| **5.** | A solution of wood bleach has a pH of 2. It could be described as: | |
|  | A | strongly acidic |
|  | B | weakly acidic |
|  | C | Neutral |
|  | D | weakly alkaline |
|  | E | strongly alkaline |
| 2 | | |

|  |  |  |
| --- | --- | --- |
| **6.** | Which of the following solutions has the highest pH? | |
|  | A | 1 mol/L ammonia |
|  | B | Vinegar |
|  | C | pure water |
|  | D | 1 mol/L hydrochloric acid |
|  | E | orange juice |
| 2 | | |

|  |  |  |
| --- | --- | --- |
| **7.** | What would happen if MgO powder was added separately to 50 mL of 0.5 mol/L HCl and 0.5 mol/L lactic acid? | |
|  | A | The lactic acid would dissolve more MgO but more slowly |
|  | B | The lactic acid would dissolve less MgO and more slowly |
|  | C | The lactic acid would dissolve the same amount of MgO but more slowly |
|  | D | The lactic acid would dissolve the same amount of MgO and at the same rate. |
|  | E | The lactic acid would dissolve more MgO and more quickly. |
| 2 | | |

Now proceed to the [answer sheet](https://docs.google.com/forms/d/e/1FAIpQLSeQLrjQBH7aed5rsLGfXXQmKkYYimxLTPXBUc-V-cyrroC-iA/viewform?usp=sf_link)