<table>
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<th>S. No</th>
<th>MCQ</th>
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| 1)    | 1. From the following which formula is correct for pH calculation?  
|       | a) log10[H+]  
|       | b) -log10[H+]  
|       | c) log2[H+]  
|       | d) -log2[H+]  
|       | **Answer:** b  
|       | **Explanation:** pH is defined as the negative logarithm of hydrogen ion concentration. Hence, its formula is -log10 [H+].  
| 2)    | Which of the following is correct in case of Pure water is known to be of the following?  
|       | a) Weak electrolyte  
|       | b) Strong electrolyte  
|       | c) Neither weak nor strong  
|       | d) Not an electrolyte  
|       | **Answer:** a  
|       | **Explanation:** Pure water is a weak electrolyte. It dissociates to form hydrogen ions and hydroxyl ions.  
| 3)    | Which of the following is the value of hydrogen ion concentration of pure water?  
|       | a) 1×10^7 moles/litre  
|       | b) 1×10^5 moles/litre  
|       | c) 1×10^6 moles/litre  
|       | d) 1×10^8 moles/litre  
|       | **Answer:** a  
|       | **Explanation:** The hydrogen ion concentration of pure water is 1×10^7 moles/litre. It can be represented as [H+] =1×10^7 moles/litre.  
| 4)    | Which of the following is the value of hydroxyl ion concentration of pure water?  
|       | a) 1×10^7 moles/litre  
|       | b) 1×10^5 moles/litre  
|       | c) 1×10^6 moles/litre  
|       | d) 1×10^8 moles/litre  
|       | **Answer:** a
Explanation: The hydroxyl ion concentration of pure water is $1 \times 10^{-7}$ moles/litre. It can be represented as $[\text{OH}^-] = 1 \times 10^{-7}$ moles/litre.

5) What is the relation between hydrogen and hydroxyl ion concentration of pure water in the following?
   a) Value of hydrogen ion concentration is greater
   b) Value of hydroxyl ion concentration is greater
   c) They are both always the same
   d) The concentrations keep changing

Answer: c
Explanation: In water, the value of hydrogen and hydroxyl ion concentrations are the same. It can be represented as $[\text{H}^+] = [\text{OH}^-]$.

6) The Nernst equation is given by which of the following statements?
   a) $E=E_o + 2.303 \frac{RT}{F} \log CH$
   b) $E=E_o - 2.303 \frac{RT}{F} \log CH$
   c) $E=E_o + 2.303 \frac{RT}{F} \log CH$
   d) $E=E_o - 2.303 \frac{RT}{F} \log CH$

Answer: a
Explanation: The Nernst equation is represented as, $E=E_o + 2.303 \frac{RT}{F} \log CH$. It is used for measuring the potential of electrodes.

7) What is the relation between the concentration of hydrogen and hydroxyl ions in an acidic solution?
   a) Value of hydrogen ion concentration is greater
   b) Value of hydroxyl ion concentration is greater
   c) They are both always the same
   d) The concentrations keep changing

Answer: a
Explanation: In acidic solution, the value of hydrogen ion concentration is greater than that of hydroxyl ion concentration. It can be represented as $[\text{H}^+] > [\text{OH}^-]$.

8) What is the relation between the concentration of hydrogen and hydroxyl ions in a basic solution?
   a) Value of hydrogen ion concentration is greater
   b) Value of hydroxyl ion concentration is greater
   c) They are both always the same

Answer: c
Explanation: In basic solution, the value of hydroxyl ion concentration is greater than that of hydrogen ion concentration. It can be represented as $[\text{OH}^-] > [\text{H}^+]$. 
<table>
<thead>
<tr>
<th>Question</th>
<th>Statement</th>
<th>Answer</th>
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<tbody>
<tr>
<td>d)</td>
<td>The concentrations keep changing</td>
<td>b</td>
<td>In basic solution, the value of hydroxyl ion concentration is greater than that of hydrogen ion concentration. It can be represented as $[\text{H}^+] &lt; [\text{OH}^-]$.</td>
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<td>9)</td>
<td>The measurement of hydrogen ion concentration can be made by measuring the potential developed in an electrochemical cell.</td>
<td>a) True</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>b) False</td>
<td>The measurement of hydrogen ion concentration can be made by measuring the potential developed in an electrochemical cell.</td>
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<td>10)</td>
<td>Slope factor is independent of temperature.</td>
<td>b</td>
<td>Slope factor is dependent on temperature. Slope factor is given by $-\frac{2.303 \times RT}{F}$.</td>
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