Assignment 1

The due date for submitting this assignment has passed. Due on 2019-02-13, 23:59 IST.
As per our records you have not submitted this assignment.

1) Pure water is neutral since
   a. it has pH 7
   b. it has equal amount of H⁺ and OH⁻ ions
   c. water does not contain free H⁺ and OH⁻ ions
   d. water cannot ionize

   No, the answer is incorrect.
   Score: 0
   Accepted Answers:
   b.

2) As the pKₐ of an acid increases, it becomes
   a. stronger acid
   b. weaker acid
   c. a neutral solution
   d. a basic solution

   No, the answer is incorrect.
   Score: 0
   Accepted Answers:
   b.

3) The concentration of H⁺ ion in pure water is
   a. 1×10⁻⁷ M
   b. 1×10⁻¹⁴ M
   c. 1×10⁻⁷ M

   No, the answer is incorrect.
   Score: 0
   Accepted Answers:
   b.
4) If the concentration of H\(^+\) ion in a medium is 1.3\(\times\)10\(^{-4}\) M, what is the concentration of OH\(^-\) ion in the solution?

- a. 7.7\(\times\)10\(^{-11}\) M
- b. 7.7\(\times\)10\(^{-7}\) M
- c. 1.3\(\times\)10\(^{-11}\) M
- d. 1.3\(\times\)10\(^{-7}\) M

No, the answer is incorrect.
Score: 0
Accepted Answers:

5) Buffers are a mixture of

- a. Strong acid and strong base
- b. Strong acid and weak base
- c. Weak acid and their conjugate base
- d. Weak base and conjugate base

No, the answer is incorrect.
Score: 0
Accepted Answers:

6) pH meter is preferred over pH paper because

- a. pH meter is cheaper than pH paper
- b. pH meter is more precise
- c. pH meter is easy to handle
- d. pH meter required no maintenance

No, the answer is incorrect.
Score: 0
Accepted Answers:

7)
A digital pH meter contains the following parts:

- a. glass electrode and monochromator
- b. rubber electrode and voltameter
- c. glass electrode and temperature sensor
- d. xenon lamp and plastic electrode

No, the answer is incorrect.
Score: 0
Accepted Answers:
c.

8) In order to prevent clogging of electrode diaphragm and generation of asymmetric potentials across the electrode, one should

- a. change the operating voltage
- b. calibrate the solution temperature
- c. calibrate the pH electrode
- d. regularly clean the electrode

No, the answer is incorrect.
Score: 0
Accepted Answers:
c.
d.

9) Buffers with high buffer capacity means

- a. the buffer has high pH value
- b. the buffer has high pKa value
- c. higher concentration of salt is present in the buffer
- d. higher concentration of acid or base is required to change the pH

No, the answer is incorrect.
Score: 0
Accepted Answers:
d.

10) Buffers used for biological experiments should have the following characteristics

- a. chemically stable and water soluble
- b. should not interact with biological molecules
- c. can change pH easily
- d. should have high ionic strength
11) Titration method for buffer preparation is useful since

a. it uses small amount of acid/base
b. can be easily monitored during preparation of unknown buffers
c. it uses definite amount of acid and bases which can be previously calculated
d. it requires solving of Henderson Hasselbalch equation

No, the answer is incorrect.
Score: 0
Accepted Answers:
a. b.

12) Two weak acids, A and B, have pKₐ values of 4 and 6, respectively. Which statement is TRUE?

a. Acid A dissociates to a greater extent in water than acid B
b. For solutions of equal concentration, acid B will have a lower pH
c. B is the conjugate base of A
d. Acid A is more likely to be a polyprotic acid than acid B

No, the answer is incorrect.
Score: 0
Accepted Answers:
a.

13) The ratio of the concentration of a ________ over ________ describes the proportions of fractional ionization of a weak acid necessary to satisfy the Henderson-Hasselbalch equation

a. conjugate acid; conjugate base
b. conjugate base; acid
c. proton donor; proton acceptor
d. proton donor; base

No, the answer is incorrect.
<table>
<thead>
<tr>
<th>Question</th>
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<th>Accepted Answers</th>
<th>Correct Answer</th>
</tr>
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<tbody>
<tr>
<td>14) The temperature has a role in the pH value of a solution since</td>
<td>1</td>
<td>b.</td>
<td>a. pH is a measurement of temperature</td>
</tr>
<tr>
<td>15) Tris buffer differs from phosphate buffer since</td>
<td>1</td>
<td>d.</td>
<td>a. They have different pH value</td>
</tr>
<tr>
<td>16) A new 5 rupee coin weighs 6 gm. Two new weighing machines (A and B) were tested with 11 coins by measuring its weight 5 times and the following was recorded.</td>
<td>1</td>
<td>d.</td>
<td>Weighing machine A: 5.97 gm, 5.99 gm, 5.98 gm, 5.96 gm and 6.00 gm.</td>
</tr>
</tbody>
</table>
To prepare 500 ml of 100 mM acetate buffer at pH 5.0, ________ volume of 0.1 M sodium acetate should be mixed with ________ volume of 0.1 M acetic acid.

- a. 70 ml and 420 ml
- b. 193 ml and 307 ml
- c. 420 ml and 70 ml
- d. 307 ml and 193 ml

No, the answer is incorrect.
Score: 0
Accepted Answers:
- d.

18. Which of the following is a Good’s buffer?

- a. HEPES
- b. Tris
- c. MES
- d. Phosphate

No, the answer is incorrect.
Score: 0
Accepted Answers:
- a.
- b.
- c.
- d.

19. Phosphate buffer is widely used because

- a. It is a Good’s buffer
- b. It closely resembles the intracellular environment
- c. Its pKa is in the biologically relevant range
- d. It is chemically inert

No, the answer is incorrect.
Score: 0
Accepted Answers:
- b.
- c.

20. Find the pH of a solution if 5.84 gm of Sodium Chloride (mol wt 58.4 gm/mol) is mixed with 1 M HCl and the volume is made up to 1000 ml.

- a. 2
- b. 3
- c. 4
- d. Not enough information is provided.
No, the answer is incorrect.
Score: 0
Accepted Answers:
- d.