

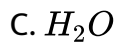
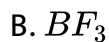


CHEMISTRY
JEE MAIN AND ADVANCED

MOCK TEST 13

Exercise

1. Which among the following is a Lewis acid?



Answer: B



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2. The species which can act both as Bronsted acid and base is



Answer: C



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3. An example of a strong electrolyte is

A. Glucose

B. Urea

C. Ammonium hydroxide

D. Sodium formate

Answer: D

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4. For a weak acid HA of concentration C (mol l^{-1}) and degree of dissociation (α), Ostwald's dilution law is represented by the equation

A. $K_a = \frac{C^2\alpha}{1 - \alpha}$

B. $K_a = \frac{\alpha^2 C}{1 - \alpha}$

C. $K_a = C\alpha$

D. $K_a = \frac{C\alpha^2}{1 - \alpha^2}$

Answer: B

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5. In the given irreversible reaction, $H_2O + HCl \rightarrow H_3O^+ + Cl^-$
the species that acts as Bronsted base is

A. H_2O

B. HCl

C. H_3O^+

D. Cl^-

Answer: A



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6. pH of a 0.001 M NaOH solution will be

A. 9

B. 3

C. 11

D. 12

Answer: C



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7. pH of a solution is 5. Thus. the concentration of hydroxyl ion in the solution is

A. 9molL^{-1}

B. 5molL^{-1}

C. 10^{-5}molL^{-1}

D. 10^{-9}molL^{-1}

Answer: D



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8. The dissociation constant of an acid, HA is 1×10^{-5} . The pH of 0.1 M solution of the acid will be

A. 3

B. 5

C. 4

D. 2

Answer: A

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9. 100 mL of 0.01 M solution of NaOH is diluted to 1 litre. The pH of resultant solution will be

A. 3

B. 12

C. 11

D. 8

Answer: C



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10. At 85°C , distilled water has $[\text{H}_3\text{O}^+]$ concentration equal to 1×10^{-6} mole/litre. The value of K_w at this temperature will be

A. $1 \cdot 10^{-8}$

B. $1 \cdot 10^{-14}$

C. $1 \cdot 10^{-12}$

D. $1 \cdot 10^{-7}$

Answer: C



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11. The pH of a solution obtained by mixing 50 mL of 2N HCl and 50 mL of 1 N NaOH is [$\log 5 = 0.7$]

A. 1.7

B. 1.3

C. 0.7

D. 0.3

Answer: D



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12. If the pH of a solution is increased from 3 to 6, then H^+ ion concentration of the solution will be

A. Increased by 1000 times

B. Reduced to half

C. Reduced by 100 times

D. Reduced by 1000 times

Answer: D

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13. Ionic product of water increases, if

A. H^+ ions are added

B. OH ions are added

C. Temperature decreases

D. Temperature increases

Answer: D

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14. The hydrogen ion concentration of 0.1 M solution of acetic acid, which is 20% dissociated, is

- A. 0.02 M
- B. 2 M
- C. 0.2 M
- D. 0.002 M

Answer: A

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15. A monobasic weak acid solution which is 0.002 M has pH value equal to 5, The percentage ionization value of the acid in the solution will be

- A. 0.5
- B. 0.005

C. 5

D. 0.05

Answer: A

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16. The solubility of AgCl will be minimum in

A. $0.1M\text{CaCl}_2$

B. $0.01M\text{AgNO}_3$

C. Pure water

D. $0.1M\text{NH}_3$

Answer: A

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17. If the solubility of $Mg(OH)_2$ in water is $S \text{ mol L}^{-1}$ then its K_{sp} will be

A. S^3

B. $4S^3$

C. $27S^3$

D. $8S^3$

Answer: B

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18. Aqueous solution of sodium acetate is

A. Alkaline

B. Neutral

C. Weakly acidic

D. Strongly acidic

Answer: A

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19. An acidic buffer solution can be prepared by mixing the solutions of

- A. Sodium chloride and sodium hydroxide
- B. Nitric acid and sodium nitrate
- C. Ammonium chloride and ammonium hydroxide
- D. Sodium acetate and acetic acid

Answer: D

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20. In hydrolysis of a salt of weak acid and strong base, the hydrolysis constant (K_a) is equal to

A. $\frac{K_w}{K_b}$

B. $\frac{K_w}{K_a \cdot K_b}$

C. $\frac{K_w}{K_a}$

D. $\frac{K_a \cdot K_b}{K_w}$

Answer: C



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21. The pH of a solution at 25°C containing 0.20 M sodium acetate and 0.06 M acetic acid is (pK_{af} or $\text{CH}_3\text{COOH} = 4.74$ and $\log 3 = 0.477$)

A. 4.36

B. 5.26

C. 5.84

D. 6.32

Answer: B



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22. The pH of 0.2 M aqueous solution of NH_4Cl will be
(pK_a of $NH_3 = 4.74$, $\log 2 = 0.3$)

A. 4.98

B. 5.42

C. 4.76

D. 4.32

Answer: A



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23. On adding ammonium chloride to a solution ammonium hydroxide

- A. Dissociation of NH_4OH increases
- B. Concentration of OH increases
- C. Concentration of OH decreases
- D. Concentration of OH remains unchanged

Answer: C



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24. Aqueous solution of which salt will not be hydrolysed?

- A. Potassium nitrate
- B. Potassium cyanide
- C. Potassium formate

D. Potassium acetate

Answer: A

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25. If K_{sp} of $HgSO_4$, is $6.4 \times 10^{-5} M^2$, then solubility of the $HgSO_4$, in water will be

A. $5.4 \cdot 10^{-5} M$

B. $8 \cdot 10^{-3} M$

C. $8 \cdot 10^{-4} M$

D. $6.4 \cdot 10^{-3} M$

Answer: B

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26. pH of 0.5 M aqueous NaCN solution is

(pK_a of HCN = 9.3, $\log 5 = 0.7$)

A. 10.3

B. 9.5

C. 10.6

D. 11.5

Answer: D



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27. The pH of an aqueous solution of 1.0M ammonium formate will be

(pK_a of formic acid = 3.8 and pK_a of ammonium hydroxide = 4.8)

A. 5.5

B. 7.5

C. 6.1

D. 6.5

Answer: D

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28. How many grams of calcium oxalate should be dissolved in water to make one litre of saturated solution? K_{sp} of CaC_2O_4 is 2.5×10^{-9} and its molecular weight is 128 u

A. $6.4 \cdot 10^{-3} g$

B. $8.0 \cdot 10^{-3} g$

C. $1.28 \cdot 10^{-3} g$

D. $6.4 \cdot 3.2^{-3} g$

Answer: A

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29. The pH at which $M(OH)_2$ will begin to precipitate from a solution containing $0.10 M M^{2+}$ ions $[K_{sp} \text{ of } M(OH)_2 = 1 \times 10^{-9} M^3]$ is

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30. If a certain buffer solution contains equal concentration of X^- and HX . Then the pH of buffer will be (K_b or X^- is 10^{-10})

A. 10

B. 4

C. 5

D. 11

Answer: B

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