

## Multiple Choice Questions

**1. A base is a substance which neutralizes an acid. Which of these substances is not a base?**

- (a) aqueous ammonia  
(b) sodium chloride  
(c) sodium carbonate  
(d) calcium oxide

**2. Lewis acid-base concept have the following characteristics except:**

- (a) formation of an adduct
- (b) formation of a co-ordinate covalent bound
- (c) donation and acceptance of an electron pair
- (d) donation and acceptance of a proton

3. **Acetic acid is a weak acid because it**  
(a) is used in cooking and flavouring food

- (b) has very low pH  
(c) is not fully ionized  
(d) does not contain any hydrogen ions

**4. A salt is not composed of**

- (a) a metallic cation  
(b) non-metallic anion  
(c) an anion of a base  
(d) an anion of an acid

5. If a liquid has a pH of 7 then it must

- (a) be a colourless and odourless liquid
- (b) freeze at  $0^{\circ}\text{C}$  and boil at  $100^{\circ}\text{C}$
- (c) be natural
- (d) be a solution containing water

## 6. A salt always

- (a) contain ions  
(b) contains water of crystallization

- (c) dissolves in water  
(d) forms crystals which conduct electricity.

**7. Dilute acids react with carbonates to produce the given products except**

- a) salt                      b) water  
c) carbon dioxide        d) hydrogen

**8. In the preparation of insoluble salts, which one of the facts is incorrect?**

- two soluble salts are mixed
- two insoluble salts are mixed
- one of the salts produced is insoluble
- both of the salts produced are insoluble

**9. A reaction between an acid and a base produces.**

- (a) salts and water  
(b) salt and gas  
(c) salt and an acid  
(d) salt and a base

10. The conjugate acid of  $\text{HPO}_4^{2-}$  is

- (a)  $\text{PO}_4^{3-}$  (b)  $\text{H}_2\text{PO}_4^{2-}$   
(c)  $\text{H}_3\text{PO}_4^-$  (d)  $\text{H}_3\text{PO}_4$

**11. What is the POH of a 0.02 M  $\text{Ca(OH)}_2$ ?**

- (a) 1.698                      (b) 1.397  
(c) 12.31                      (d) 12.61

**12. Which one of the following species is not amphoteric?**

- (a)  $\text{H}_2\text{O}$                       (c)  $\text{NH}_3$

- (c)  $\text{HCO}_3^-$  (d)  $\text{SO}_4^{2-}$

**13. The product of Lewis acid-base reaction is called adduct. The bond between the adduct species is**

- (a) ionic  
(b) covalent  
(c) metallic  
(d) co-ordinate covalent

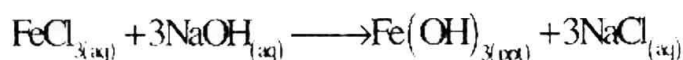
**14. The water of crystallization is responsible for the**

- (a) melting points of crystals  
(b) boiling points of crystals  
(c) shapes of crystals  
(d) transition point of crystals

**15. You want to dry a gas which one of the following salt you will use?**

- (a)  $\text{CaCl}_2$  (b)  $\text{NaCl}$   
(c)  $\text{CaO}$  (d)  $\text{Na}_2\text{SiO}_3$

**16. Ferric hydroxide ( $\text{Fe}(\text{OH})_3$ ) is precipitated out of solution when aqueous sodium hydroxide solution is added to ferric chloride ( $\text{FeCl}_3$ )**



**Colour of the precipitate**

- (a) white (b) blue  
(c) dirty green (d) brown

**17. Which ion is the conjugate base of sulphuric acid?**

- (a)  $\text{SO}_3^{2-}$  (b)  $\text{S}^{2-}$   
(c)  $\text{HSO}_3^-$  (d)  $\text{HSO}_4^-$

**18. Which one of the following is a Lewis base?**

- (a)  $\text{NH}_3$  (b)  $\text{BF}_3$   
(c)  $\text{H}^+$  (d)  $\text{AlCl}_3$

**19. According to the Lewis concept, acid is a substance which can**

- (a) donate a proton  
(b) donate a pair of electron  
(c) accept a proton  
(d) accept a pair of electron

**20. Give  $K_w = [\text{H}^+][\text{OH}^-] = 1.0 \times 10^{-14}$  at  $25^\circ\text{C}$  what is the concentration of  $\text{H}^+$  in pure water at  $25^\circ\text{C}$ ?**

- (a)  $1 \times 10^{-7} \text{ mol dm}^{-3}$   
(b)  $1 \times 10^7 \text{ mol dm}^{-3}$   
(c)  $1 \times 10^{-14} \text{ mol dm}^{-3}$   
(d)  $1 \times 10^{14} \text{ mol dm}^{-3}$

**21. Jabir Bin Haiyan prepared**

- (a) Nitric acid (b) hydrochloric acid  
(c) Sulphuric acid (d) All of these

**22. Lavoisier named binary compounds of oxygen acids in**

- (a) 1787 (b) 1790  
(c) 1815 (d) 1828

**23. Who proved that the presence of hydrogen as the main constituent of all acids.**

- (a) Lavoisier (b) Humphrey Davy  
(c) Dalton (d) Arrhenius

**24. The word acid is derived from the**

- (a) Greek word (b) Latin word  
(c) English word (d) Arabic word

**25. Acidus means**

- (a) Sour (b) Bitter  
(c) Sweet (d) salty

**26. Which acid is present in our stomach.**

- (a) Nitric acid (b) Hydrochloric acid  
(c) Sulphuric acid (d) All of these

**27. All acids turn blue litmus**

- (a) Red (b) Blue  
(c) Pink (d) White
28. All bases turn red litmus  
(a) Red (b) Blue  
(c) Pink (d) White
29. Arrhenius presented his concept about acids and bases in  
(a) 1785 (b) 1787  
(c) 1923 (d) 1930
30. According to Arrhenius concept acid is a substance which dissociates in aqueous solution to give  
(a) Hydrogen ions (b) Hydroxide ions  
(c) Both a & b (d) None of these
31. According to Arrhenius concept base is a substance which dissociates in aqueous solution to give  
(a) Hydrogen ions (b) Hydroxide ion  
(c) Both a & b (d) None of these
32. Which one is not an Arrhenius acid?  
(a) HCl (b)  $\text{H}_2\text{SO}_4$   
(c)  $\text{CO}_2$  (d)  $\text{HNO}_3$
33. Which one is not an Arrhenius base?  
(a) NaOH (b) KOH  
(c)  $\text{Ca}(\text{OH})_2$  (d)  $\text{NH}_3$
34. Bronsted and Lowry presented their theories of acids and bases in  
(a) 1785 (b) 1787  
(c) 1923 (d) 1925
35. According to Bronsted and Lowry concept an acid is a substance that can donate  
(a) proton (b) electron pair  
(c) neutron (d) electron

36. A conjugate acid is a specie formed by accepting a  
(a) proton (b) electron pair  
(c) neutron (d) electron
37. According to Bronsted and Lowry concept a base is a substance that can accept  
(a) proton (b) electron pair  
(c) neutron (d) electron
38. A conjugate base is a specie formed by donating a  
(a) proton (b) electron pair  
(c) neutron (d) electron
39. A substance which can behave as an acid as well as a base is called  
(a) Acid (b) base  
(c) amphoteric (d) neutral
40. According to Lewis concept a base is a substance which can donate  
(a) Proton (b) electron pair  
(c) neutron (d) electron
41. According to Lewis concept an acid is a substance which can accept  
(a) proton (b) electron  
(c) neutron (d) electron pair
42. The product of any Lewis acid base reaction is a single specie called  
(a) salt (b) water  
(c) adduct (d) none
43. Which one is Lewis acid?  
(a)  $\text{BF}_3$  (b)  $\text{AlCl}_3$   
(c)  $\text{FeCl}_3$  (d) All these
44. Which one is Lewis base?  
(a)  $\text{NH}_3$  (b)  $\text{R-NH}_2$   
(c) ROH (d) All of these
45. When acids react with metals which gas is evolved?

- (a)  $H_2$  (b)  $O_2$   
(c)  $Cl_2$  (d)  $N_2$
- 46. When acids react with carbonates and bicarbonates which gas is evolved?**  
(a)  $H_2$  (b)  $CO_2$   
(c)  $Cl_2$  (d)  $N_2$
- 47. When acid reacts with sulphites and bisulphites which gas is evolved?**  
(a)  $H_2$  (b)  $CO_2$   
(c)  $SO_2$  (d)  $NH_3$
- 48. Which one is mineral acid?**  
(a)  $HCl$  (b)  $H_2SO_4$   
(c)  $HNO_3$  (d) All of these
- 49. Which acid is used as an electrolyte in lead storage battery?**  
(a)  $H_2SO_4$  (b)  $HNO_3$   
(c)  $HCl$  (d)  $CH_3COOH$
- 50. Which acid is used for etching designs on copper plates?**  
(a)  $H_2SO_4$  (b)  $HNO_3$   
(c)  $HCl$  (d)  $CH_3COOH$
- 51. Which acid is used for food preservation?**  
(a)  $H_2SO_4$  (b)  $HNO_3$   
(c)  $HCl$  (d)  $CH_3COOH$
- 52. Citric acid is present in**  
(a) citrus fruits (b) sour milk  
(c) Rancid butter (d) apple
- 53. Formic acid is present in**  
(a) stings of bees (b) sour milk  
(c) apple (d) fats
- 54. Butyric acid is present in**  
(a) citrus acid (b) sour milk  
(c) rancid butter (d) apple
- 55. Mallic acid is present in**  
(a) Apple (b) Feats  
(c) String of bees (d) urine

- 56. Uric acid is present in**  
(a) apple (b) fats  
(c) urine (d) grapes
- 57. stearic acid present in**  
(a) apples (b) fats  
(c) urine (d) grapes
- 58. Alkalis react with ammonium salt to liberate**  
(a)  $SO_2$  (b)  $CO_2$   
(c)  $NH_3$  (d)  $H_2$
- 59. Which is used to manufacture of soap?**  
(a)  $NaOH$  (b)  $Ca(OH)_2$   
(c)  $KOH$  (d)  $Mg(OH)_2$
- 60. Which one is used for alkaline batteries?**  
(a)  $NaOH$  (b)  $Ca(OH)_2$   
(c)  $KOH$  (d)  $Mg(OH)_2$
- 61. Which is used as foaming agent in fire extinguishers?**  
(a)  $NaOH$  (b)  $KOH$   
(c)  $Al(OH)_3$  (d)  $NH_4OH$
- 62. Which is used to remove the grease stains from clothes?**  
(a)  $NaOH$  (b)  $KOH$   
(c)  $Al(OH)_3$  (d)  $NH_4OH$
- 63. The value of constant of ionic product of water  $K_w$  at 25°C**  
(a)  $1.0 \times 10^{-4}$  (b)  $1.0 \times 10^{-14}$   
(c)  $1.0 \times 10^{-7}$  (d)  $1.0 \times 10^{-7}$
- 64. pH value normally varies from**  
(a) 0 - 14 (b) 1 - 14  
(c) 7 - 14 (d) 10 - 14
- 65. pH of neutral solution is always**  
(a) 6 (b) 5  
(c) 7 (d) 10
- 66. Acidic solutions have pH value**

- (a) less than 7      (b) greater than 7  
(c) equal to 7      (d) None of these

**67. Basic solutions have pH value**

- (a) Less than 7      (b) greater than 7  
(c) equal to 7      (d) none of these

**68. Indicators are the**

- (a) Inorganic compounds  
(b) organic compounds  
(c) Ionic compounds  
(d) covalent compounds

**69. Phenolphthalein produces red colour in**

- (a) Acid      (b) base  
(c) both a & b      (d) None

**70. Methyl orange produces which colour in basic solution**

- (a) Red      (b) Yellow

- (c) Pink      (d) white

**71. Which salt is used as a table salt?**

- (a) NaCl      (b)  $\text{Na}_2\text{CO}_3$   
(c)  $\text{Na}_2\text{SiO}_3$       (d) NaCl

**72. Which salt is used for the manufacture of detergents, pulp and paper?**

- (a) NaCl      (b)  $\text{Na}_2\text{CO}_3$   
(c)  $\text{Na}_2\text{SiO}_3$       (d) NaCl

**73. Which is used for cleaning agent for domestic and commercial purpose?**

- (a) NaCl      (b)  $\text{Na}_2\text{CO}_3$   
(c)  $\text{NaHCO}_3$       (d)  $\text{Na}_2\text{SiO}_3$

## Answer Key

1	b	2	d	3	c	4	c	5	c
6	a	7	d	8	d	9	a	10	c
11	b	12	d	13	d	14	c	15	c
16	d	17	d	18	a	19	d	20	a
21	b	22	a	23	b	24	b	25	a
26	b	27	a	28	b	29	b	30	a
31	b	32	c	33	b	34	c	35	a
36	a	37	a	38	a	39	c	40	b
41	d	42	c	43	d	44	d	45	a
46	b	47	c	48	d	49	a	50	b
51	d	52	a	53	a	54	c	55	a
56	c	57	b	58	c	59	a	60	c
61	c	62	d	63	b	64	a	65	c
66	a	67	b	68	b	69	b	70	b
71	a	72	b	73	d				