CHEMISTRY – 6

1. For converting aniline into chlorobenzene, which of the following reagent is not used?
A. HCl B. CuCl C. HNO_3 D. Cl_2

2. Glycerol when treated with a mixture of conc. HNO_3 and conc. H_2SO_4 forms
A. glycerol mononitrate B. nitro glycerine
C. glycerol dinitrate D. acrolein

3. Which of the following will yield carboxylic acid on hydrolysis in acidic medium?
A. Ethyl mag-bromide B. Ethyl isocynate
C. Ethanenitrile D. None of the above

4. Which of the following will have lowest value of pK_b?
A. $(CH_3)_2NH$ B. $C_6H_5NH_2$ C. CH_3NH_2 D. NH_3

5. Hydroazobenzene on treatment with H_2SO_4 forms
A. Benzidine B. Azobenzene
C. Azobenzene sulphonic acid D. None of the above

6. A sample of $CaCO_3$ contains 3.01×10^{23} ions of Ca^{2+} and CO_3^{2-}. The mass of the sample is (Given atomic mass: Ca = 40, C = 12, O = 16)
A. 50 g B. 5 g C. 100 g D. 200 g

7. An atom that does not have any neutron is
A. tritium B. helium C. hydrogen D. deuterium

8. Among the various allotropes of carbon,
A. $1s^2 2s^2 2p^5$ B. $1s^2 2s^2 2p^4$
C. $1s^2 2s^2 2p^3$ D. $1s^2 2s^2 2p^6 3s^2 3p^5$

9. Which of the following does not have a co-ordination bond?
A. HNO_3 B. H_3O^+ C. PCl_5 D. O_3

10. Which of the following molecules will have polar bonds but zero dipole moment?
A. $CHCl_3$ B. CF_4 C. O_2 D. None

11. Which orbital is represented by the complete wave function Ψ 410?
A. 4p B. 3d C. 3p D. 4s

12. The heat exchange at constant volume for the decomposition of Silver (I) Oxide is found to be 3.66 kJ. The heat change at constant pressure will be

A. > 30.66 kJ B. < 30.66 kJ C. 30.66 kJ D. unpredictable

13. The compound whose 0.1 M solution is basic is

A. Sodium acetate B. Ammonium sulphate

C. Ammonium chloride D. Ammonium acetate

14. For a chemical reaction A → products, the rate of reaction doubles when the concentration of A is increased by 4 times. The order of reaction is

A. 0 B. 1/2 C. 1 D. 4

15. An aqueous solution of non-electrolyte 'A' with molecular mass 60 contains 6 g in 500 ml and has a density equal to 1.05. The molality of solution is

A. 0.30 B. 0.25 C. 0.19 D. 1.25

16. The solubility of K_2SO_4 in water is 16 g per 100 mL at 50°C. The least weight of water that will dissolve 4 g of this substance at the same temperature is

A. 25 g B. 10 g C. 50 g D. 75 g

17. A solution has positively charged colloidal particles. Which of the following solutions is required in lowest concentration for coagulation?

A. Na_2SO_4 B. $ZnCl_2$

C. $K_4[Fe(CN)_6$ D. NaCl

18. If the half-life of an isotope X is 10 years, its decay constant is

A. 0.00692 Yr^{-1} B. 0.06932 Yr^{-1}

C. 0.6932 Yr^{-1} D. 6.932 Yr^{-1}

19. How many electrons flow when a current of 5 amperes is passed through a solution for 200 seconds?

A. 6.24×10^{21} B. 6.2×10^{22}

C. 6.02×10^{23} D. 6.024×10^{21}

20. A catalyst in the finely divided state is more efficient because in this state

A. it can react with one of the reactant more efficiently

B. it has larger activation energy

C. it has large surface area

D. all of the above

21. The atoms/ion listed in correct order of increasing size are

A. Be^{2+}, Mg^{2+}, Na^{+} B. Na^{+}, Cl^{-}, K^{+}

C. Al, Na, S D. Na, Si, H

22. Which one is not a mineral of sodium?

A. Chile saltpeter B. Cryolite C. Petalite D. Rock salt

23. In which of the compounds does hydrogen have an oxidation state of - 1?

A. CaH_2 B. HCl C. NH_3 D. CH_4

24. Chemical A is used for water softening to remove temporary hardness. A reacts with sodium carbonate to generate caustic soda. When CO_2 is bubbled through it turns cloudy. What is the chemical formula of A?

A. $Ca(HCO_3)_2$ B. $Ca(OH)_2$ C. CaO D. $CaCO_3$

25. Which of the following configurations is characteristic of group 15 elements?

A. $ns^1\ ns^4$ B. $(n - 1)\ d^{10}\ ns^2\ np^4$ C. $(n - 1)\ d^{10}\ ns^2\ np^2$ D. $ns^2\ np^3$

26. The highest ionization potential in a period is shown by

A. halogens B. noble gases

C. alkaline earth metals D. alkali metals

27. Which of the following has maximum covalent character?

A. $AlCl_3$ B. $BaCl_2$

C. NaCl D. CsCl

28. $KClO_3$ on warming with conc. HCl gives

A. desiccant B. washing agent

C. bleaching agent D. medicine

29. Borzole is obtained by reacting B_2H_6 with

A. NH_3 in the ratio 1 : 4 B. NH_3 in the ratio 1 : 2

C. NH_3 in the ratio 2 : 1 D. None of the above

30. Which of the following does not exist?

A. PBr_3 B. PCI_5 C. PI_7 D. PF_5

31. Copper pyrites is concentrated by

A. distillation
B. fractionation
C. gravity separation
D. floatation process

32. Sodium metal cannot be stored in
A. toluene
B. alcohol
C. kerosene
D. benzene

33. Which of the following is called calomel?
A. $Hg(NO_3)_2$
B. $HgCl_2$
C. Hg_2Cl_2
D. $HgSO_4$

34. Anhydrous FeSO4 is
A. brown
B. green
C. white
D. black

35. The hardness of water is estimated by
A. distillation method
B. titrimetric method
C. EDTA method
D. conductivity method

36. Diamagnetism is the property of
A. non-transition metals
B. completely filled electronic subshells
C. unpaired electrons
D. nucleons

37. Marsh test is used for
A. arsenic
B. potassium
C. barium
D. aluminium

38. Refrigeration helps in food preservation by
A. greatly reducing the rates by biochemical reaction
B. sealing the food with a layer of ice
C. destroying enzyme action
D. killing the germs

39. An example of a psychedelic agent is
A. LSD
B. TNT
C. DNA
D. DDT

40. Which of the following represents soap?
A. $C_{15}H_{31}COOH$
B. $(C_{17}H_{35}COO)_2Ca$
C. $C_{17}H_{35}COOK$
D. $C_{17}H_{35}COOH$

41. Which of the following isomerism is shown by ethyl acetoacetate?
A. Diastereoisomerism
B. Geometry isomerism

C. Keto-enol isomerism D. Enantisomerism

42. A formula of a compound, which gives simple whole number atomic ratio in one molecule of a compound, is called
A. Diastereoisomerism B. Geometry isomerism
C. Keto-enol isomerism D. Enantisomerism

43. Pure anhydrous magnesium chloride can be prepared from hydrated salt by
A. They exist in equilibrium
B. They possess same electronic arrangement but different atomic arrangements
C. They possess same molecular mass
D. They have different electronic as well as atomic arrangements

44. The process of separation of recemic modification into d and l isomers is called
A. dehydrohalogenation B. revolution
C. resolution D. dehydration

45. Ethyl alcohol gives ethyl chloride with the help of
A. KCl B. Cl_2 C. $SOCl_2$ D. NaCl

46. Which of the following will form when calcium acetate is distilled?
A. Formaldehyde B. Ethanal
C. Propanal D. Acetone

47. Ethyl amine on oxidation in the presence of $KMnO_4$ gives
A. an acid B. an N-oxide
C. an alcohol D. an aldehyde

48. Amongst the following compounds, which is most acidic?
A. Picric acid B. Phenol
C. Ethanol D. p-nitrophenol

49. The number of sodium atoms in 2 moles of sodium ferrocyanide is
A. $8 \times 6.02 \times 10^{23}$ B. $4 \times 6.02 \times 10^{23}$ C. 6.02×10^{23} D. 2

50. How many unpaired electrons are there in Ni^{2+}?
A. 2 B. 8 C. 0 D. 4

51. Which block of the periodic table contains the element with configuration $1s^2 2s^2 2p^6 3s^2 3p^6 3d^{10} 4s^1$?

A. f-block
B. d-block
C. p-block
D. s-block

52. The maximum number of covalent bonds by which the two atoms can be bonded to each other is

A. three
B. four
C. two
D. no fixed number

53. Which of the following is an ionic compound?

A. $CHCl_3$
B. KI
C. ICl
D. SO_3

54. The threshold wavelength for the ejection of electron from metal X is 330 Nm. The work function for the photoelectric emission from metal X is ($h = 6.6 \times 10^{-34}$ J sec)

A. 1.2×10^{-20} J
B. 6×10^{-12} J
C. 6×10^{-19} J
D. 1.2×10^{-20} J

55. HI was heated in a sealed tube at 440oC till the equilibrium was reached. HI was found to be 22 % decomposed. The equilibrium constant for dissociation is

A. 1.99
B. 0.0199
C. 0.282
D. 0.0796

56. A chemical reaction with $\Delta H > 0$ carried out at constant temperature and pressure will necessarily be spontaneous if

A. $\Delta G > 0$
B. $\Delta S < 0$
C. $\Delta H > T\Delta S$
D. $\Delta H < T\Delta S$

57. The concentration of acetic acid ($Ka = 1.8 \times 10^{-5}$) required to give 3.5×10^{-4} moles/litre of H_3O^+ ions is

A. 1.94 mol L^{-1}
B. 6.8 x 10 –3 mol L^{-1}
C. 0.194 mol L^{-1}
D. 9.8 mol L^{-1}

58. Which of the following liquid will exhibit highest vapour pressure?

A. H_2O (l)
B. HF (l)
C. NH_3 (l)
D. C_2H_5OH (l)

59. The substance A when dissolved in solvent B shows the molecular mass corresponding to A_3. The Vant Hoff's factor will be

A. 1/3
B. 3
C. 2
D. 1

60. A decimolar solution of pot. Ferrocyanide is 50% dissociated at 300 K. Calculate the O.P. of the solution (R = 8.314 JK^{-1} mol^{-1}).

A. 7.389 atm B. 73.89 atm C. 0.7389 atm D. None

61. A sample of gas occupies 300 dm^3 at 27°C and 750 pressure. What contraction in volume takes place, when the gas is cooled to - 33°C at 750 mm pressure?

A. 120 dm^3 B. 240 dm^3

C. 60 dm^3 D. No change in volume

62. The oxidization state of nitrogen in N_3H is

A. - 1/3 B. + 1/2 C. + 3 D. - 1

63. Silver iodide is used for producing artificial rain because AgI

A. is insoluble in water B. has crystal structure similar to ice

C. is easy to spray at high altitude D. is easy to synthesize

64. A substance X is a compound of an element of group IA. The substance X gives a violet colour in flame test. X is

A. NaCl B. KCl

C. LiCl D. None

65. The metal carbonate that is thermally least stable is

A. $BeCO_3$ B. $BaCO_3$ C. $CaCO_3$ D. $MgCO_3$

66. In P_4O_6, the number of oxygen atoms bonded to each phosphorus atom is

A. 4 B. 3 C. 2 D. 1.5

67. Which of the following represents Caro's acid?

A. Dithionic acid B. Peroxydisulphuric acid

C. Peroxymono sulphuric acid D. Thio sulphuric acid

68. Electron affinity is highest for the halogen

A. Cl_2 B. I_2 C. F_2 D. Br_2

69. Carburetted water gas used for lighting and heating purposes, is a mixture of water gas and

A. natural gas B. coal gas

C. oil gas D. producer gas

70. Witting reagent contains

A. phosphorus B. sulphur C. xenon D. nitrogen

71. In the preparation of oxygen from potassium chlorate, MnO_2 acts as a/an

A. dehydrating agent B. catalyst

C. activator D. autocatalyst

72. Meta phosphoric acid has the formula

A. H_3PO_3 B. H_3PO_2 C. HPO_3 D. H_3PO_4

73. The number of s and p bonds in Borazole are

A. 12σ and 3π B. 6σ and 6π

C. 12σ and 12π D. None

74. The underlining of blast furnace is made of

A. fire clay bricks B. basic bricks

C. silica rocks D. graphite

75. The starting material used in Solvay's process is

A. Brine solution B. Sodium sulphate

C. Carnallite D. All of them together

76. The solubility of silver bromide in hypo solution is due to the formation of

A. $[Ag(S_2O_3)]^-$ B. $[Ag(S_2O_3)_2]^-$

C. Ag_2S_2O D. Ag_2SO_3

77. Thermal decomposition method is used to purify

A. Ti B. Ni C. Zr D. Cr

78. Which of the following cannot reduce the acidified solution of permanganate?

A. Fe^{2+} ions B. Nascent hydrogen

C. H_2 D. $(COOH)_2$

79. A colloidal solution obtained by adding a mixture of stannous chloride and stannic chloride solution to a solution of gold chloride is known as

A. cinna bar B. ruby

C. fulminating gold D. purple of cassius

80. Cynocobalamin contains which element

A. Co B. Ca C. Zn D. Mg

81. Dil. HCl solution cannot be concentrated by boiling beyond

A. 22% B. 44% C. 11% D. 33%

82. Which of the following is not a condensation polymer?

A. Glyptal B. Dacron C. Nylon-66 D. PTFE

83. The enzyme that converts glucose and fructose into ethyl alcohol is

A. maltase B. zymase C. invertase D. diastase

84. Which is an explosive?

A. p.nitrophenol B. R.D.X.

C. Toluene D. All

85. Which of the following represents carbon suboxide?

A. C_3O_2 B. CO_2 C. CO D. C_2O_3

86. Which of the following can yield acetylene in one step?

A. Ethene B. Ethylene dichloride

C. Sodium acetate D. Propyne

87. Two solids A and B have appreciable different solubilities in water, but their melting points are very close. The mixture of A and B can be separated by

A. distillation B. specific method

C. sublimation D. fractional crystallization

88. Petroleum consists mainly of

A. aromatic hydrocarbons B. aliphatic alcohols

C. aliphatic hydrocarbons D. none of these

89. X on treatment with sodium hydroxide followed by the addition of silver nitrate gives white precipitate at room temp, which are soluble in NH_4OH. X can be

A. Vinyl chloride B. Benzyl chloride

C. Ethyl bromide D. Chloro benzene

90. Which of the following compound contains intermolecular H-bonds?

A. resorcinol B. ethanoic acid C. o-nitrophenol D. phenol

91. Phenol reacts with bromine in carbon disulphide at low temperature to give

A. 2, 4, 6-Tribromophenol B. p-Bromophenol

C. o-and p-Bromophenol D. m-Bromophenol

92. For obtaining 2-butanone from acetyl chloride, which of the following reagent can be employed?

A. $H_2Pd/BaSO_4$

B. Reaction with $(C_2H_5)_2Cd$ in the presence of dry ether

C. Grignard, reagent

D. Reaction with HI

93. In Benzilic acid rearrangement,

A. Benzil is converted into Benzilic acid B. Benzilic acid is converted into Benzil

C. Benzoin is converted into Benzilic acid D. C_6H_5CHO is converted into Benzoin

94. Chlorination of CS_2 in the presence of $AlCl_3$ gives

A. CCl_4 and chloroform B. S_2Cl_2 only

C. Both CCl_4 and S_2Cl_2 D. Chloroform only

95. A person adds 1.71 gram of sugar ($C_{12}H_{22}O_{11}$) in order to sweeten his tea. The number of carbon atoms added are (mol. mass of sugar = 342)

A. 7.2×10^{21} B. 3.6×10^{22}

C. 6.6×10^{22} D. 0.05

96. An element has the electronic configuration $1s^2 2s^2 2p^6 3s^2 3p^6 3d^{10} 4s^2 4p^3$. Its properties are similar to

A. oxygen B. chlorine C. boron D. nitrogen

97. Which among the following is not iso-electronic?

A. O_2^{2+} B. NO^- C. CN^- D. N_2

98. Polarization is the distortion of the shape of an anion by an adjacently placed cation. Which of the following statements is correct?

A. Polarizing power of cation is less than that of anion

B. A large cation is likely to bring about a large degree of polarization

C. Maximum polarization is brought about by a cation of high charge

D. Minimum polarization is brought about a large degree of polarization

99. Which bond angle around X would result in the maximum dipole moment for the triatomic molecule XY_2?

A. $\theta = 120^o$ B. $\theta = 150^o$ C. $\theta = 90^o$ D. $\theta = 180^o$

100. In the formation of N_2^+ from N_2, the electron is removed from

A. a π * orbital B. a σ * orbital

C. a π orbital D. a σ orbital

Solutions:

1	2	3	4	5	6	7	8	9	10
D	B	C	A	A	A	C	D	B	B
11	12	13	14	15	16	17	18	19	20
A	A	A	B	C	A	C	B	A	C
21	22	23	24	25	26	27	28	29	30
A	C	A	B	D	B	A	C	B	C
31	32	33	34	35	36	37	38	39	40
D	B	C	C	C	B	A	A	A	C
41	42	43	44	45	46	47	48	49	50
C	B	B	C	C	C	B	A	A	A
51	52	53	54	55	56	57	58	59	60
B	A	B	C	C	D	B	C	A	A
61	62	63	64	65	66	67	68	69	70
C	A	B	B	A	B	C	A	B	A
71	72	73	74	75	76	77	78	79	80
B	C	A	A	A	B	B	C	D	A
81	82	83	84	85	86	87	88	89	90
A	D	B	B	A	B	D	C	B	C
91	92	93	94	95	96	97	98	99	100
C	B	A	C	B	D	B	C	C	D