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CHEMISTRY – 1997

1. **The hybridization state of C atom in butendioic acid is :**
   (1) sp^2 (2) sp^3 (3) both two (4) sp

2. **Which of the following is not a isomer of pentane** :
   (1) n-pentane
   (2) 2, 2-dimethy 1 propane
   (3) 2, 3-dimethy 1 butane
   (4) 2-methy 1 butane

3. **The oxidation number of C atom in Ch_2CI_2 and CCI_4 are respectively :**
   (1) -2 and – 4 (2) 0 and – 4 (3) 0 and 4 (4) 2 and 4

4. **Which of the following dissolves in lonic solvents :**
   (1) C_6H_5 (2) CH_3OH (3) CCI_4 (4) C_5H_{12}

5. **The conjugate acid of HS is :**
   (1) S^{-2} (2) H_2S_2 (3) both two (4) none

6. **Phenolphthalein of pH range [8-10] is used in which of the following type of titration as a suitable indicator :**
   (1) NH_4OH and HCI
   (2) NH_4OH and HCOOH
   (3) NH_4OH and $C_2H_4O_2$
   (4) NaOH and $C_2O_4H_2$

7. **Which of the following is iron are :**
   (1) Malachite (2) Hernatite (3) Siderite (4) Limonite

8. **The molar concentration of chloride ions in the resulting solution of 300 ml.of 3.0 M NaCI and 200 ml. of 4.0 M $BaCl_2$ will be :**
   (1) 1.7 M (2) 1.8 M (3) 5.0 M (4) 3.5 M

9. **Which of the following has least bond energy :**
   (1) N_2^{-2} (2) N_2^- (3) N_2^+ (4) N_2

10. **Which of the following species has highest bond energy :**
    (1) O_2^{-2} (2) O_2^+ (3) O_2^- (4) O_2

11. **Which of the following compound is not aromatic :**
    (1) 1, 3-cyclobutene
    (2) pyridine
    (3) furane
    (4) thiophene

12. Which of the following compound is used as refrigerant :

(1) CCI_2F_2
(2) CCI_4
(3) CF_4
(4) Acetone

13. Which of the following is weak acid :

(1) C_6H_6 (2) CH_3-C≡CH (3) $CH_2=CH_2$ (4) CH_3-C≡C-CH_3

14. L.P.G. mainly consist of the following :

(1) Methane (2) Hydrogen (3) Acetylene (4) Butane

15. The solubility product of $CaCo_3$ is 5×10^{-9}. The solubility will be :

(1) 2.5×10^{-5} (2) 7×10^{-5} (3) 2.5×10^{-4} (4) 2.2×10^{-9}

16. The outer electronic configuration of alkali earth metals is :

(1) nd^{10} (2) ns^1 (3) np^6 (4) ns_2

17. The nature of 2, 4, 6-trinitrophenol is :

(1) Neutral (2) Basic (3) Acidic (4) Weak basic

18. Which of the following group is sharp ortho and para directive :

(1) $-C_6H_5$ (2)-OH (3) $-CH_3$ (4) –CI

19. By which of the following process hydrocarbons are found from petroleum :

(1) combustion
(2) fractional distillation
(3) addition
(4) all above

20. A sample of petroleum contains 30% n-heptane, 10% 2-methyl hexane and 60% 2, 2, 4-trimethyl pentane, the octane no. of this sample will be :

(1) 30% (2) 60% (3) 10% (4) 70%

21. In which of the following halogens p-electrons does not take part in resonance :

(1) $CH_2=CH-CH_2Cl$ (2) BrC_6H_5
(3) C_6H_5Cl (4) $CH_2=CHCl$

22. Which of the following statement is false :

(1) 40% solution HCHO is known as formalin
(2) HCHO is least reactive in its homologous series
(3) The B.P. of isovarelaldehyde is less than n-varelaldehyde
(4) The boiling point of ketones are higher than that of aldehydes

23. If n + ι= 8 then the expected no. of orbitals will be :

(1) 4 (2) 9 (3) 16 (4) 25

24. $A \xrightarrow{\text{Alc. KOH}} B \xrightarrow{2Cl_2} C \xrightarrow{Ca(OH)_2}$ **here the compound C will be :**

(1) Lewsite (2) Westron (3) Acetylene tetra chloride (4) Both 2 and 3

25. Which of the following is least hydrolysed :

(1) $BeCl_2$ (2) $MgCl_2$ (3) $CaCl_2$ (3) $BaCl_2$

26. The laughing gas is :

(1) N_2O_4 (2) NO (3) N_2O (4) N_2O_5

27. The hydrogen ion concentration of a solution is 3.98×10^{-6} mole per liter. The pH value of this solution will be :

(1) 6.0 (2) 5.8 (3) 5.4 (4) 5.9

28. The reaction of sodium acetate and sodalime gives :

(1) Butane (2) Ethane (3) Methane (4) Propane

29. Which of the following acids does not contain – COOH group :

(1) Carbamic acid (2) Barbituric acid
(3) Lactic acid (4) succinnic acid

30. Which of the following compound of xenone does not exists :

(1) XeF_6 (2) XeF_4 (4) XeF_5 (4) XeF_2

31. $FeSO_4$, $7H_2O$ is :

(1) Mohr's salt (2) Blue vitriol (3) Green vitriol (4) White vitriol

32. The solution of BiCl3 in dil. HCI when diluted with water white precipitate is formed which is :

(1) Bismith oxychloride (2) Bismith oxide
(3) Bismith hydroxide (3) none of these

33. The strongest acid is :

(1) acetic acid
(2) trichloroacetic acid
(3) dichloracetic acid
(4) monochloroacetic acid

34. The false statement regarding alkane is :

(1) This does not perform polymerization reaction
(2) This does not gives elimination reaction
(3) It does not disappear the colour of dilute $KMnO_4$ solution
(4) It does not decolourise bromine water

35. Which of the following is strongest base :

(1) $C_6H_5NH_2$ (2) CH_3NH_2

(3) NH_3 (4) CH_3CONH_2

36. Which of the following aromatic compound gives sulphonation reaction very easily :
(1) Chlorobenzene (2) Nitrobenzene (3) Toluene (4) benzene

37. The geometry of I3- is :
(1) Triangular (2) Linear (3) Tetrahedral (4) T-shape

38. The half life of a radio active element is 140 days. 1 gm. of this element after 560 days will become :
(1) $\frac{1}{16}$ gm (2) $\frac{1}{4}$gm (3) $\frac{1}{8}$gm. (4) $\frac{1}{2}$ gm.

39. **The volume concentration of hydrogen peroxide 6.8% concentration will be** :
(1) 5 (2) 11.2 (3) 22.4 (4) 20

40. Which of the following on combustion give maximum energy :
(1) Ethane (2) Propane (3) Methane (4) Butane

41. $C6H6 + CH3CI \xrightarrow{\text{Anhy. } AICI_3} C6H5CH3 + HCI$ **The name of above reaction is :**
(1) Gattermann (2) Reimer-tiemann
(3) Friedel-Craft (4) Cannizaro

42. The oxidation state of Cr in $K_2Cr_2O_7$ is :
(1) + 4 (2) + 3 (3) + 6 (4) + 5

43. The natural rubber is the polymer of :
(1) 1, 3- butadiene (2) polyamide (3) isoprene (4) none of these

44. Nylone-66 is a :
(1) polyester (2) polyamide (3) polyacrylate (4) none of these

45. $2NO(g) + CI_2(g) \underset{\leftarrow\leftarrow}{\rightarrow\rightarrow} 2\,NOCI$ **The equilibrium constant for this reaction is :**

(1) $K_c = \frac{[NOCI]^2}{[NO]^2[CI_2]^2}$ (2) $K_c = \frac{[NOCI]^2}{[2NO]^2[CI_2]}$

(3) $K_c = \frac{[NOCI]^2}{[NO]^2\,[CI^2]}$ (4) $K_c = \frac{[2NOCI]}{[2NO][CI]}$

46. $C_6H_6 + CO + HCI \xrightarrow{A} C_6H_5CHO + HCI$ **here A is :**
(1) anhydrans ZnO (2) $V_2O_5/450^0$ C
(3) anhydrous $AICO_3$ (4) solid KOH

47. The values of for HCN and CH_3COOH are 7.2×10^{-10} and 1.75×10^{-5} (at 25^0 C) respectively. The strongest acid amongst them is :
(1) CH_3COOH(2) HCN (3) both (4) none of these

48. In which of the following carbon atom (asterisk) is asymmetric :
(1) $CH_3CH_2CH\ (CH_3)\ CH_2OH$
(2) $CH_3CH_2CH\ (CH_3)\ CHOH$
(3) $CH_3CH_2CH_2CH_2CH_2OH$
(4) $CH_3CH_2CH\ (CH_3)CH_2OH$

49. Benzene reacts with CH_3COCI in presence of Lewis acid $AICI_3$ to form :
(1) Acetophenone (2) Toluene (3) Benzyl Chloride (4) Chlorobenzene

50. Which of the following is reducing agent :
(1) H_2S (2) HNO_3 (3) H_2O (4) $K_2Cr_2O_7$

51. In which of the following alkyl chloride the possibility of SN_1 reaction mechanism is maximum :
(1) $(CH_3)_2CHCI$ (2) $(CH_3)_3C\text{-}CI$ (3) CH_3CI (4) CH_3CH_2CI

52. The energy produced realated to mass decay of 0.02 amu is :
(1) 28.2 MeV (2) 931 MeV (3) 18.62 MeV (4) none of these

53. The mole of hydrogen ion in 50 ml. of 0.1 M HCI solution will be :
(1) 5×10^2 (2) 5×10^{-3} (3) 5×10^3 (4) 5×10^{-2}

54. Petroleum is mainly consist of :
(1) Aliphatic alcohol
(2) Aromatic hydrocarbon
(3) Alipnetic hydrocarbon
(4) None of these

55. $C_6H_6OCH_3 + HI \xrightarrow{\Delta\Delta}$ …….. + …….. The products in the above reaction will be :

(1) $C_6H_5I+CH_3OH$ (2) $C_6H_5CH_3+HOI$
(3) $C_6H_5OH+CH_3I$ (4) $C_6H_6+CH_3OI$

56 F3 is :
(1) Bronsted base (2) Lewis base (3) Lewis acid (4) Bronsted acid

57. Which of the following compound gives violet colour with $FeCI_3$ solution:
(1) Benzaldehyde (2) Aniline (3) Nitrobenzene (4) Phenol

58. Hypo solution forms which of the following complex compound with AgCI :
(1) $Na_5[Ag(S_2O_3)_3]$ (2) $Na_3[Ag(S_2O_3)_2]$

(3) $Na_2\{Ag(S_2O_3)_2]$ (4) $Na_3[Ag(S_2O_3)_3]$

59. Molecular oxygen is :
(1) ferro magnetic (2) diamagnetic (3) para magnetic (4) non magnetic

60. Bonds in acetylene are :
(1) 2π bonds (2) one π bond (3) 3π bonds (4) none of these

61. The false statement for Griynaed reagent is :
(1) It gives tertiary alcohol with acetamide
(2) It gives tertiary alcohol with acetone
(3) It gives secondary alcohol with acetaldehyde
(4) It gives primary alcohol with formaldehyde

62. Which of the following alkane exists is liquid state at normal temperature :
(1) $C_{20}H_{42}$ (2) C_3H_8 (3) C_8H_{18} (4) CH_4

63. The solubility of AgCI at 25^0 C will be maximum in :
(1) Potassium chloride solution
(2) $AgNO_3$ solution
(3) Water
(4) All above

64. The weight of a benzene molecule is :
(1) 78 gm. (2) 7.8 gm. (3) 13×10^{-23} (4) none of these

65. $CuFeS_2$ is :
(1) iorn pyrites (2) malachite (3) chalcosite (4) chalcopyrites

66. Primary halides follow the following reaction mechanism :
(1) SN_1 (2) SN_2 (3) both (4) none of these

67. C and Si belong to the same group of periodic table, CO_2 is a gas and SiO_2 is a :
(1) liquid (2) gas (3) solid (4) none of these

68. H_2S is a gas while H_2O is a liquid because :
(1) there is association due to hydrogen bonding
(2) bond energy of OH high
(3) the ionization potential of oxygen is high
(4) the electro negativity of oxygen is high

69. "The negative part of the molecule adding to the double bond goes to that unsaturated asymmetric carbon atom which is linked to the least number of hydrogen atoms." This statement is related to :
(1) Markownikoff's law
(2) Peroxide effect
(3) Bayer's law of distortion

(4) none of these

70. The conjugate base of NH3 is :

(1) N_2H_4 (2) NH_2^- (3) NH_4^+ (4) NH_2^+

71. (a) N_2 and (b) C_2H_2. The nos. of π and σ bond in the molecules are respectively :

(1) (a) 2,2 (b) 2,2 (2) (a) 1,2 (b) 2,1
(3) (a) 2,1 (b) 2,3 (4) (a) 2,1 (b) 2,1

72. In which of the following compound there are maximum no. of sp^2 hybrid C atoms:

(1) Benzene (2) 1,3,5-hexatriene
(2) 1,2,4-hexatriene (4) both 1 and 2

73. The shape of the molecule having hybrid orbitals of 20% character will be :

(1) octahedral (2) tetrahedral
(3) square planer (4) triangular bipyramidal

74. The pH of a solution is 5. If the dilution of this solution is increased by 100 times, the pH value will be :

(1) 5 (2) 7 (3) 9 (4) 8

75. The required amount of oxygen for combustion of 20 ml. of gaseous hydrocarbon is 50 ml. The hydrocarbon will be :

(1) C_2H_2 (2) C_2H_4 (3) C_2H_6 (4) C_3H_4

76. The formula of Celestine is :

(1) $SrSO_4$ (2) $SrCO_3$ (3) SrO (4) $SrCl_2$

77. $CuCl_2 + \rightarrow Cu + Cl_2$. The required amount of electricity for this reaction is :

(1) 4 faraday (2) 2 faraday (3) 1 faraday (4) 3 faraday

78. Nitrogen does not forms NF_5 because :

(1) The bondenergy of N≡N is very high
(2) Vaccent d-orbitals are not present
(3) N belongs to V group
(4) There is inert effect

79. The normal temperature when raised by 10^0 C, the rate of reaction will be :

(1) lowered by 2 times
(2) increased by 2 times
(3) lowered by 10 times
(4) increased by 10 times

80. Which of the following gives red precipitate with ammonical cuprous chloride :

(1) Propane (2) Ethane (3) Methane (4) Acetylene

81. $[Cu(NH_3)_4]^{2+}$ snows the following hybridization :
(1) dsp^2 (2) sp^3d (3) dsp^3 (4) sp^3

82. A solution contains CI-, I^- and S O_4^{3-} ions in it. Which of the following ion is capable to precipitate all of above when added in this solution :
(1) Pb^{2+} (2) Ba^{2+} (3) Hg^{2+} (4) Cu^{2+}

83. Fool's gold is :
(1) Cu_2S (2) FeS_2 (3) Al_2O_5 (4) $CuFeS_2$

84. In which of the following compound the central atom is in sp^2 hybrid state :
(1) OF_2 (2) $HgCl_2$ (3) XeF_2 (4) NH_2^+

85. The number of alkenyl groups possible from $C_4H_7^-$ are :
(1) 7 (2) 5 (3) 3 (4) 8

86. The tetraethyl lead mixed in petrol is works as :
(1) Cooling agent
(2) Anti knocking agent
(3) Bleaching agent
(4) None of these

87. The alkaline hydrolysis of ester is known as :
(1) dehydrogenation (2) dehydration (3) esterification (4) saponification

88. The degree of ionization of 0.4 M acetic acid will be : ($K_a = 1.8 \times 10^{-5}$)
(1) 6.71×10^{-3} (2) 1.6×10^{-3}
(3) $0.4 \times 1.8 \times 10^{-5}$ (4) 1.8×10^{-5}

89. Haber process is used for production of which of the following :
(1) NH_3 (2) HNO_3 (3) H_2SO_4 (4) O_3

90. The p_{ka} value of phenolphthalein is 9.1 and the pH range is 8-10. In which of the following titrations it can be used as an indicator :
(1) $NH_4OH$and HCI
(2) NH_4OH and CH_3COOH
(3) NaOH and HCI
(4) NH_4OH

91. Number of electrons in a one molecule of CO_2 :
(1) pb^{2+} (2) Hg^{2+} (3) Ba^{2+} (4) Cu^{2+}

92. Which of the following species shows the maximum magnetic moment :
(1) Mn^{+6} (2) Ni^{2+} (3) Fe^{3+} (4) Ag^+

93. K_{sp} value of CaF_2 is 3.75×10^{11} The solubility will be :

(1) $1.45x10^{-11}$ mol/litre^{-1}
(2) $3.45x10^{-4}$ mol/liter^{-1}
(3) $2.05x10^{-4}$ mol/liter^{-1}
(4) 3.75×10^{-11} mol/liter^{-1}

94. When Pb_3O_4 is heated with dilute H N O_3 it gives :
(1) pbO_2 and $pb(NO_3)_2$
(2) pbO and $pb(NO_3)_2$
(3) pbO_2
(4) pbO

95. C-H bond length is least in :
(1) Acetylene (2) Methane (3) Ethylene (4) Ethane

96. The minimum nos. of carbon atoms in ketones which will show chain isomerism will be :
(1) Seven (2) four (3) six (4) five

97. Which of the following organic compound could not be dried by anhydrous $CaCI_2$:
(1) ethanol (2) benzene (3) chloroform (4) ethyl acetate

98. Which of the following compound forms white precipitate with bromine water :
(1) Nitrobenzene (2) Phenol (3) Benzene (4) all above

99. Gypsum is :
(1) $CaSO_4.H_2O$ (2) $CaSO_4.\ 2H_2O$
(3) $2CaSO_4.\ 2H_2O$ (4) $CaSO_4$

100. Which of the following carbonium ion is most stable :
(1) CH_3-C(+)—CH_3 (2) CH_3CH_2(+)

(3) $CH_30CH(+)$-CH_3 (4) CH_3(+)

ANSWER SHEET

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