CAREERS360

MBSE HSSLC CHEMISTRY 2014

MODEL QUESTION PAPER

CHEMISTRY

1. Heating pyrites to remove sulphur is called

   (A) Roasting (B) Smelting

   (C) Calcination (D) Liquation

2. What is the other name for the d-block elements ?

   (A) Representative elements (B) Transition elements

   (C) Inner transition elements (D) Transuranium elements

3. The solubility product of AgBr is 3.6×10^{-13} , then its solubility is

   (A) 1.8×10^{-7} (B) 3.6×10^{-26}

   (C) 6.0×10^{-7} (D) 7.2×10^{-26}

4. The process of displacement of electrons along the chain of carbon atoms due to the presence of a polar covalent bond at one end of the chain is called

   (A) electromeric effect (B) mesomeric effect

   (C) inductive effect (D) hyperconjugation

5. Laughing gas is

   (A) NO (B) N_2O

   (C) NO_2 (D) NO_3

6. The value of $-40°C$ in Fahrenheit scale is

   (A) $-40°F$ (B) $32°F$

   (C) $-80°F$ (D) $140°F$

7. The colligative properties of a solution depends on

   (A) the number of particles of solvent

   (B) the number of particles of solute

   (C) the nature of particles of solute

   (D) the nature of particles of solvent

8. +2 oxidation state is predominant in Pb due to

(A) common ion effect (B) solvent effect

(C) photoelectric effect (D) inert pair effect

9. The basic strength of amines in the gas phase increases in the order

(A) 1^o amine < 2^o amine < 3^o amine (B) 3^o amine < 1^o amine < 2^o amine

(C) 1^o amine > 2^o amine > 3^o amine (D) 2^o amine > 3^o amine > 1^o amine

10. The long form of the Periodic Table is based on

(A) atomic size (B) electronic configuration

(C) atomic mass (D) metallic character

11. $CuSO_4 . 5H_2O$ is called

(A) Blue vitriol (B) Cinnabar

(C) Lunar caustic (D) Red vitriol

12. Consider the following statements

(i) Entropy of the universe is constant

(ii) All natural processes are irreversible thermodynamically

(iii) Gibb's energy is a state function

(iv) Enthalpy of combustion is always negative

The correct statement(s) is/are

(A) (ii) only (B) (i) and (ii)

(C) (i), (iii) and (iv) (D) (ii), (iii) and (iv)

13. The IUPAC name of $CH_3 - O - C(CH_3)_3$ is

(A) 2-Methoxy-2-methylpropane

(B) 2- Methoxy-2,2-dimethylethane

(C) 2,2,2-Methoxy dimethylethane

(D) 1-Ethoxy-2,2-dimethylethane

14. Be and Mg does not give flame colouration because of

(A) low stability (B) large atomic radius

(C) high ionization enthalpy (D) low hydration enthalpy

15. The oxidation state of Cr in potassium dichromate is

(A) +5 (B) +6

(C) +7 (D) +8

16. The S.I. unit of conductivity (specific conductance) is

(A) Sm^{-1} (B) S

(C) m^{-1} (D) Sm^2mol^{-1}

17. The process of separating the particles of colloids from crystalloids by means of diffusion through a suitable membrane is

(A) Peptization (B) Ultra-centrifugation

(C) Ultra-filtration (D) Dialysis

18. Choose the correct increasing order of acidic character from the following carboxylic derivatives

(A) $FCH_2COOH < ClCH_2COOH < CH_3COOH < C_2H_5COOH$

(B) $C_2H_5COOH < CH_3COOH < ClCH_2COOH < FCH_2COOH$

(C) $CH_3COOH < C_2H_5COOH < ClCH_2COOH < FCH_2COOH$

(D) $FCH_2COOH < ClCH_2COOH < C_2H_5COOH < CH_3COOH$

19. Which of the following statements is FALSE ?

(A) Ozone layer does not permit infrared radiation from the sun to reach the earth

(B) Acid rain is due to the oxides of nitrogen and sulphur in the air

(C) Greenhouse Effect is responsible for global warming

(D) CF_2Cl_2 causes depletion of ozone layer

20. According to Boyle's law, at constant mass and temperature, the volume of a fixed mass of gas is

(A) inversely proportional to pressure

(B) directly proportional to pressure

(C) constant

(D) not related to pressure

21. The atomic mass of an element is 24 and the third shell of its atom contains 2 electrons. The number of protons in its nucleus will be

(A) 22 (B) 12

(C) 10 (D) 8

22. The most abundant element in the earth's crust is

(A) Aluminium (B) Silicon

(C) Oxygen (D) Iron

23. Actinoid contraction is due to increase in

(A) atomic number (B) shielding of f-orbital

(C) size of the f-orbital (D) effective nuclear charge

24. Choose the correct statement from the following

(A) Bakelite is an example of thermoplastic

(B) Co-polymer is a polymer formed from one type of monomer

(C) Glyptal is used in manufacture of paints

(D) Nylon-2-nylon-6 is non-biodegradable

25. Which technique of purification is based on the difference in the rates at which the components of a mixture are adsorbed on a suitable adsorbent ?

(A) Chromatography (B) Differential extraction

(C) Steam distillation (D) Fractional distillation

26. The half life of a first order reaction whose specific rate constant is $20s^{-1}$ is

(A) 3.465×10^{-3} s (B) 3.465×10^{-2} s

(C) 4.385×10^{-3} s (D) 4.385×10^{-2} s

27. Which of the following statements is incorrect ?

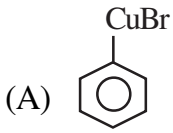
(A) Strong acid has a weak conjugate base

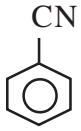
(B) ΔG should be negative for spontaneous reaction

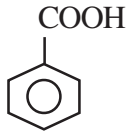
(C) For water, the conjugate acid and base are H^+ and OH^- respectively

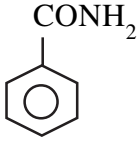
(D) NH_4Cl is an example of basic buffer

28. The product of the following reaction is

(A) 

(B) 

(C) 

(D) 

29. The chemical formula of heavy water is represented as

(A) H_2O (B) D_2O

(C) T_2O (D) P_2O

30. In an electromagnetic spectrum, the correct order with respect to frequency is

(A) microwaves > UV – rays > γ – rays > X – rays

(B) X – rays > γ – rays > microwaves > UV – rays

(C) UV – rays > microwaves > X – rays > γ – rays

(D) γ – rays > X – rays > UV – rays > microwaves

31. Solutions showing positive deviation from Raoult's law have

(A) ΔH_{mixing} = – ve and ΔV_{mixing} = – ve

(B) ΔH_{mixing} =+ve and ΔV_{mixing} = – ve

(C) ΔH_{mixing} =+ve and ΔV_{mixing} = + ve

(D) ΔH_{mixing} = – ve and ΔV_{mixing} = + ve

32. Nitrogen exists as a gas because it

(A) is highly reactive

(B) forms multiple bonds

(C) is small in size

(D) has a weak tendency for catenation

33. In the reaction given below, the product 'Y' will be

$$HCHO \xrightarrow{CH_3MgI} X \xrightarrow[-Mg(OH)I]{H^+/H_2O} Y$$

(A) CH_3CH_2OH (B) CH_3COOH

(C) CH_3OH (D) HCOOH

34. The correct decreasing order of stability of the different conformation of butane is

(A) Skew > Eclipsed > Anti > Fully eclipsed

(B) Anti > Eclipsed > Skew > Fully eclipsed

(C) Anti > Skew > Eclipsed > Fully eclipsed

(D) Skew > Anti > Fully eclipsed > Eclipsed

35. The bond that determines the secondary structure of protein is

(A) covalent bond (B) hydrogen bond

(C) sulphur linkage (D) ionic bond

36. Which of the following is true for the reaction

$N_2(g) + O_2(g) \rightleftharpoons 2NO(g), \Delta H = +180$ kJ ?

(A) Increase in temperature favors the backward reaction

(B) Change in temperature does not have any effect on equilibrium

(C) Increase in pressure favors the forward reaction

(D) Change in pressure does not have any effect on equilibrium

37. Saturated solution of KNO_3 is used to make salt bridge because

(A) the velocity of K^+ is smaller than that of NO_3^-

(B) the velocity of K^+ is greater than that of NO_3^-

(C) the velocites of both K^+ and NO_3^- are nearly same

(D) KNO_3 is a highly volatile substance

38. The purple colour of potassium permanganate is due to

(A) charge transfer (B) d-d transition

(C) f-f transition (D) d-f transition

39. Number of moles of oxygen in 16 g of oxygen molecule is

(A) 0.5 (B) 1

(C) 1.5 (D) 2

40. Phenol is more resonance stabilised than ethyl alcohol because

(A) phenol has higher boiling point than alcohol

(B) of stronger hydrogen bonding in phenol than in ethyl alcohol

(C) phenoxide ion is more resonance stabilised than phenol

(D) ethoxide ion is less resonance stabilised than ethyl alcohol

41. When the temperature increases, viscosity of the liquid

(A) remains constant (B) increases

(C) decreases (D) shows irregular behavior

42. Buna-N is formed by the condensation polymerization of

(A) Hexamethylene diammine and adipic acid

(B) Buta-1,3-diene and acrylonitrile

(C) Phenol and acrylonitrile

(D) 1,3-butadiene and adipic acid

43. Which of the following statements is TRUE ?

(A) Mercury is a biodegradable pollutant

(B) Classical smog is oxidising in nature

(C) CO_2 is the most important Greenhouse gas

(D) BOD of clean water should be more than 5 ppm

44. If the unit of the reaction rate constant is $Lmol^{-1}s^{-1}$, then the reaction is of

(A) second order (B) zero order

(C) first order (D) third order

45. During the preparation of aldehyde from alcohol $CH_3CH_2OH \xrightarrow{Z} CH_3CHO + H_2$; the catalytic reagent used (Z) is

(A) Cu, 573K (B) MnO, 573K

(C) Zn, HCl (D) Pd, $BaSO_4$

46. Which of the following statements is *not true* regarding Crystal Field Theory ?

(A) The crystal field splitting is lesser in octahedral complexes than in tetrahedral complexes

(B) Tetrahedral complexes have four ligands while octahedral complexes have six ligands

(C) Strong field ligands produce low spin complex

(D) Weak field ligands produce high spin complex

47. In Group 16 elements, the acidic character of the hydrides follows the order

(A) $H_2O < H_2S < H_2Se < H_2Te$ (B) $H_2Te < H_2S < H_2Se < H_2O$

(C) $H_2S < H_2O < H_2Te < H_2Se$ (D) $H_2Se < H_2S < H_2O < H_2Te$

48. During a redox reaction in an electrochemical cell

(A) chemical energy is converted into electrical energy

(B) electrical energy is converted into chemical energy

(C) cathode is negative and anode is positive

(D) electron flows from cathode to anode in the external circuit

49. The correct IUPAC name of the compound $CH_3-\underset{\displaystyle CH_3}{\underset{|}{CH}}-NH_2$ is

(A) 2-aminopropane (B) Propan-2-amine

(C) 1-methylpropanamine (D) 1-amino-1-methylethane

50. According to the kinetic theory of gases, when gas molecules collide with one another and also against the walls of the container,

(A) there is no gain or loss of kinetic energy

(B) gain of kinetic energy occurs

(C) loss of kinetic energy occurs

(D) the molecules are at rest

51. Which of the following is not permissible arrangement for electrons in an atom ?

(A) $n = 4,\ l = 2,\ m_l = -2,\ m_s = -\frac{1}{2}$ (B) $n = 2,\ l = 1,\ m_l = 0,\ m_s = -\frac{1}{2}$

(C) $n = 5,\ l = 2,\ m_l = 3,\ m_s = -\frac{1}{2}$ (D) $n = 3,\ l = 2,\ m_l = 1,\ m_s = \frac{1}{2}$

52. In an electrolytic cell, the electrode connected to the positive terminal is called the

(A) anode (B) cathode

(C) salt bridge (D) none of the above

53. The extent of physical adsorption of gas on a solid increases with

(A) increase in temperature (B) decrease in pressure

(C) decrease in temperature (D) decrease in volume

54. In a crystal system, if $a = b = c$ and $\alpha = \beta = \gamma \neq 90^{\circ}$, then the crystal system is

(A) cubic (B) monoclinic

(C) rhombohedral (D) triclinic

55. Isotonic solutions are solutions having the same

(A) isotopes (B) surface tension

(C) osmotic pressure (D) vapour pressure

56. In a chemical reaction, the molecularity of a reaction is

(A) either a fraction or a zero

(B) obtained from a single balanced equation

(C) equal to the sum of the powers of the reactants in the rate law

(D) an experimentally determined quantity

57. Aldehydes are easily oxidised to carboxylic acid by using

(A) Hinsberg's reagent (B) Jones reagent

(C) Schiff's reagent (D) Tollen's reagent

58. The catalyst used in Friedel Craft reaction is a

(A) Lewis acid (B) Lewis base

(C) Grignard reagent (D) Jones reagent

59. The stable electronic configuration of Chromium is

(A) $[Ar]3d^4 4s^2$ (B) $[Ar]3d^5 4s^1$

(C) $[Ar]3d^6 4s^2$ (D) $[Ar]3d^6 4s^1$

60. Consider the following statements regarding the properties of solids

(i) Increase in temperature decreases electrical conductivity of semiconductors

(ii) Silicon doped with arsenic gives *n*-type semiconductor

(iii) The outermost filled energy band is called conduction band

(iv) Diamagnetic materials are weakly repelled by magnetic field

The correct statement(s) is/are

(A) (i) only (B) (iii) only

(C) (i), (ii) and (iv) (D) (i), (iii) and (iv)

61. Which of the following is not isoelectronic with the other ions ?

(A) N^{3-} (B) O^{2-}

(C) Na^+ (D) Mg^+

62. Which of the following is incorrect in relation to electron gain enthalpy ?

(A) Larger the size of the atom, smaller will be the electron gain enthalpy

(B) More stable the electronic configuration of the atom, smaller will be the electron gain enthalpy

(C) Larger the size of the atom, larger will be the electron gain enthalpy

(D) Greater the magnitude of nuclear charge, larger will be the electron gain enthalpy

63. In thermodynamical processes, the equation $q_V = \Delta U$ is achieved at

(A) constant volume and temperature (B) constant volume and pressure

(C) constant temperature and pressure (D) constant temperature only

64. The standard emf for the cell $Fe/Fe^{2+}(1.0M)||Ni^{2+}(1.0M)/Ni$ with the values $E^oNi^{2+}/Ni = -0.25V$ and $E^oFe^{2+}/Fe = -0.44V$ is

(A) -0.19 V (B) $+0.19$ V

(C) -0.69 V (D) $+0.69$ V

65. When the activation energy is low, the rate of the reaction is

(A) slow (B) constant

(C) intermediate (D) fast

66. An ionic solid AB has an octahedral structure like that of NaCl. If the radius of A^+ is 100 pm, what will be the coordination number of B^- ?

(A) 2 (B) 4

(C) 6 (D) 8

67. Which of the following is a non-polar compound ?

(A) $CHCl_3$ (B) CH_2Cl_2

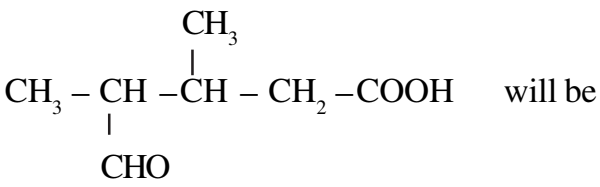
(C) CH_3Cl (D) CCl_4

68. The scattering of light by colloidal particles was first observed by

(A) Faraday (B) Robert Brown

(C) Tyndall (D) Hardy Schulze

69. According to the IUPAC nomenclature, the name of the organic compound



will be

(A) 4 – carbonyl – 3 – methylpentanoic acid

(B) 4 – formyl – 3 – methylpentanoic acid

(C) 4 – carboxy – 2, 3 – dimethylbutanal

(D) 4 – carboxy – 2, 3 – dimethylpentanal

70. The hardness of water is due to the presence of

(i) Calcium bicarbonates (ii) Calcium hydroxides

(iii) Magnesium chlorides (iv) Magnesium sulphates

(A) (i) and (ii) (B) (ii) and (iii)

(C) (i), (iii) and (iv) (D) (ii), (iii) and (iv)

71. Bivalent titanium ion is paramagnetic because it has

(A) a variable valency

(B) two unpaired electrons in the valence shell

(C) a completely filled valence shell

(D) one unpaired electron in the valence shell

72. The following terms are used for expressing concentration of a solution. Select the one which is independent of temperature

(A) Formality (B) Normality

(C) Molarity (D) Molality

73. The lowest alkene capable of exhibiting geometrical isomerism is

(A) 1- Butene (B) 2-Pentene

(C) 2,3-Dimethylbutene (D) 2-Butene

74. Hydrogen is sometimes called rogue element because it

(A) resembles both alkali metals and halogens

(B) has different isotopes

(C) resembles alkali metals

(D) resembles halogens

75. The colour of alkali metal halides is generally due to the presence of

(A) Schottky defect (B) Frenkel defect

(C) F-centres (D) Impurity defect

76. Which statement is *not true* about the S_N2 reaction ?

(A) The reaction is a one step process

(B) The nucleophile attack from the backside

(C) Methyl halide react most rapidly among the alkyl halides

(D) The rate of reaction is determined by the formation of a stable carbocation

77. Which of the complementary pairs hold true for RNA ?

(i) AT (ii) GC (iii) AU (iv) GT

(A) (i) only (B) (iii) only

(C) (ii) and (iii) (D) (i) and (ii)

78. For the reaction $C_6H_5NH_2 + NaNO_2 + 2HCl \xrightarrow{273K} X$, the product 'X' is

(A) Phenol (B) Chlorobenzene

(C) Benzene diazonium chloride (D) Nitrobenzene

79. Which of the following statements about the Modern Periodic Table of elements are not correct ?

(i) Metallic character generally decreases with increase in atomic number across the period

(ii) Atomic radii decreases with increase in atomic number down the group

(iii) The ionisation enthalpy decreases with increase in atomic number across the period

(iv) Electronegativity generally increases across the period and decreases down the group

(A) (i) and (ii) (B) (ii) and (iii)

(C) (iii) and (iv) (D) (i) and (iv)

80. The oxidation state(s) of flourine is/are

(A) -1 (B) $+1, +3$

(C) $+1, +3, +5$ (D) $+1, +3, +5, +7$

81. The ionization energy of hydrogen atom is

(A) -1312 KJ/mol (B) 1312 KJ/mol

(C) -2624 KJ/mol (D) 2624 KJ/mol

82. Which of the following is not a coordination compound ?

(A) $K_3[Fe(CN)_6]$ (B) $[Mn(H_2O)_6]^{2+}$

(C) $FeSO_4(NH_4)_2SO_4$ (D) $Ni(CO)_4$

83. Consider the following statements about soaps and detergents

(i) Soaps are bio-degradable

(ii) Soaps cannot be used in acidic medium

(iii) Detergents are sodium salts of fatty acids

(iv) Synthetic detergents are more soluble in water than soaps

The correct statement(s) is/are

(A) (i) only (B) (i) and (iv)

(C) (iii) only (D) (i), (ii) and (iv)

84. The chemical formula for limestone is

(A) $CaHCO_3$ (B) $CaSO_4$

(C) $Ca(OH)_2$ (D) $CaCO_3$

85. The Van't Hoff Factor for solutions undergoing dissociation is

(A) always greater than 1 (B) always less than 1

(C) always equals to 1 (D) always equals to zero

86. Scurvy is caused by the deficiency of

(A) Lactic acid (B) Retinol

(C) Ascorbic acid (D) Riboflavin

87. The rate of formation of CH_3OH in the following reaction will be

$2C(s) + 4H_2(g) + O_2(g) \longrightarrow 2CH_3OH\ (l),\ \Delta_f H = -478kJ$

(A) -53 kJ (B) 68kJ

(C) -239 kJ (D) 478kJ

88. Select the inappropriate sentence about drugs from the following

(A) Analgesics have pain relieving effect

(B) Antipyretic helps in lowering body temperature

(C) Sulphadimidine is an example of antihistamines

(D) Sulphanilamide is an example of antimicrobials

89. Butter is a/an

(A) sol (B) emulsion

(C) micelle (D) gel

90. Which of the following elements has the largest atomic radius ?

(A) Al (B) C

(C) Si (D) O

91. Reaction of primary amines with alcoholic KOH and $CHCl_3$ to give isocyanide is known as

(A) Carbylamine reaction (B) Hoffmann's reaction

(C) Mendius reaction (D) Schotten Baumann reaction

92. The structure of SCl_2 is

(A) square planar (B) tetrahedral

(C) angular (D) linear

93. Brass is an alloy containing

(A) Zn & Cu (B) Cu & Ar

(C) Cr & Ar (D) Fe & Ag

94. Which of the following is called inorganic benzene ?

(A) Borazine (B) Diborane

(C) Silicone (D) Boric acid

95. Vulcanization of rubber is done at a temperature of

(A) 313 – 375 K (B) 373 – 415K

(C) 413 – 475K (D) 473 – 515K

96. The normality of a 2.0M H_2SO_4 solution is

(A) 2N (B) 4N

(C) 6N (D) 8N

97. The boiling point of a liquid at 1 atm pressure is

(A) Standard boiling point (B) Vapour density

(C) Critical temperature (D) Normal boiling point

98. A system absorbs 800J of heat and does work equivalent to 400 J on its surroundings. The change in the internal energy for this process is

(A) 2 J (B) 400 J

(C) 1.2 kJ (D) 320 kJ

99. H_3PO_3 behaves as a

(A) monobasic acid (B) dibasic acid

(C) tribasic acid (D) tetrabasic acid

100. Read the following statements

(i) Artificial sweeteners are low calorie sweeteners

(ii) BHP is a commonly used antioxidant

(iii) Dettol is an example of an antiseptic

(iv) Omeprazole is a very good antacid

The correct statement(s) is/are

(A) (ii) only (B) (iii) only

(C) (i), (ii) and (iv) (D) (i), (iii) and (iv)