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Previous Year Paper

Chemistry - 2004

Multiple Choice Questions

1. Which of the following can be represented by the configuration [Kr] $5s^2$?
   A. Ca
   B. Sr
   C. Ba
   D. Ra

   Answer
2. 2p orbitals have
   A. n = 1; l = 2
   B. n = 1; l = 0
   C. n = 2; l = 1
   D. n = 2; l = 0

   Answer
3. Aufbau principle is not satisfied by
   A. Cr and Cl
   B. Cu and Ag
   C. Cr and Mg
   D. Cu and Na

   Answer
4. Neutrons are found in atoms of all elements except in
   A. chlorine
   B. oxygen
   C. argon
   D. hydrogen

   Answer
5. The atomic weight of an element is 39. The number of neutrons in its nucleus is one more than the number of protons. The number of protons, neutrons and electrons-respectively in its atoms would be
   A. 19, 20, 19
   B. 19, 19, 20
   C. 20, 19, 19
   D. 20, 19, 20

   Answer
6. Out of the following electronic configurations the one of a transition element is

A. $1s^2, 2s^2 2p^6, 3s^2 3p^6 3d^{10}, 4s^2 4p^6$

B. $1s^2, 2s^2 2p^6, 3s^2 3p^6 3d^3, 4s^2$

C. $1s^2, 2s^2 2p^6, 3s^2 3p^6, 4s^2$

D. $1s^2, 2s^2 2p^6, 3s^2 3p^6 3d^{10}, 4s^2 4p^1$

Answer

7. A covalent bond between two atoms is formed by which of the following?

   A. Electron nuclear attraction

   B. Electron sharing

   C. Electron transfer

   D. Electrostatic attraction

   Answer

8. Hybridisation involves

   A. addition of an electron pair

   B. mixing up of atomic orbitals

   C. removal of an electron pair

   D. separation of orbitals

   Answer

9. On the basis of Molecular Orbital Theory (MOT) which molecule does not exist?

   A. H_2

   B. He2+

   C. He_2

   D. Li_2

   Answer

10. Which of the following compounds in liquid state does not have hydrogen bonding?

    A. H_2O

    B. HF

    C. NH_3

    D. C_6H_6

    Answer

11. What weight of hydrated oxalic acid should be added for complete neutralisation of 100 mL of 0.2 N -NaOH solution?

    A. 0.45 gm

    B. 0.90 gm

    C. 1.08 gm

    D. 1.26 gm

    Answer

12. The number of moles of a solute in its solution is 20 and total number of moles are 80. The mole fraction of solute is

A. 2.5
B. 0.25
C. 1
D. 0.75

Answer

13. The relation between K_p and K_c is correctly shown as

A. $K_c = K_p (RT)\Delta ng$

B. $K_p = K_c (RT)^{-\Delta ng}$

C. $K_p = K_c (RT)\Delta ng$

D. $K_c = K_p (RT)^{-\Delta ng}$

Answer

14. In the formation of SO_3 according to following equilibrium $2SO_2 + O_2 \rightleftharpoons 2SO_3$ + heat, which conditions favour the formation of SO_3?

A. Low pressure

B. Low concentration of oxygen

C. Low temperature and use of catalyst

D. High temperature without using catalyst

Answer

15. Which of the following mixtures forms an acid buffer?

A. NaOH + HCl

B. $CH_3COOH + CH_3COONa$

C. $NH_4OH + NH_4Cl$

D. $H_2CO_3 + (NH_4)_2CO_3$

Answer

16. When NH_4Cl is added to NH_4OH solution, the dissociation of ammonium hydroxide is reduced. It is due to

A. common ion effect

B. hydrolysis

C. oxidation

D. reduction

Answer

17. Strongest Bronsted base among the following anions is

A. ClO^-

B. ClO2-

C. ClO3-

D. ClO4-

Answer

18. pH of a solution is 4. The hydroxide ion concentration of the solution would be

A. 10^{-4}

B. 10^{-10}

C. 10^{-2}

D. 10^{-12}

Answer

19. Heat of neutralisation of NH_4OH and HCl is

A. equal to 13.7 kcal

B. more than 13.7 kcal

C. less than 13.7 kcal

D. more than one is correct

Answer

20. Which of the following relation is correct?

A. $\Delta H = \Delta G + T\Delta S$

B. $\Delta H = -\Delta G - T\Delta S$

C. $\Delta H = \Delta G - T\Delta S$

D. $\Delta H = -\Delta G + T\Delta S$

Answer

21. The element with atomic number 55 belongs to which block of the periodic table?

A. s-block

B. p-block

C. d-block

D. f-block

Answer

22. Which of the following has largest size?

A. Al

B. Al^{+}

C. Al^{2+}

D. Al^{3+}

Answer

23. To which block is related an element having electronic configuration $1s^2$, $2s^2$ $2p^6$, $3s^2$ $3p^6$ $3d^{10}$, $4s^1$ in the periodic table?

A. s-block

B. p-block

C. d-block

D. f-block

Answer

24. The electronic configuration of an element is $1s^2$, $2s^2$, $2p^6$, $3s^2$ $3p^6$, $3d^{10}$, $4s^2$ $4p^3$. Its properties

would be similar to which of the following elements?

A. Boron

B. Oxygen

C. Nitrogen

D. Chlorine

Answer

25. The number of sp^3-hybridised carbon atoms in cyclohexene are

A. 2

B. 3

C. 4

D. 6

Answer

26. The formula of phosphate of a metal, M is MPO_4. The formula of its nitrate will be

A. M NO_3

B. M $(NO_3)_2$

C. M $(NO_3)_3$

D. $M_2(NO_3)_3$

Answer

27. The formula of phosphate of a metal, M is M NH_4PO_4. The formula of its sulphate will be

A. M SO_4

B. M $(SO_4)_2$

C. M_2SO_4

D. M_2 $(SO_4)_3$

Answer

28. A 100 mL solution of 0.1 N HCl was titrated with 0.2 N NaOH solution.The titration was discontinued after adding 30 mL of NaOH solution. The remaining titration was completed by adding 025 N KOH solution. The volume of KOH required for completing the titration is

A. 16 mL

B. 32 mL

C. 35 mL

D. 70 mL

Answer

29. On which of the following principles hydrogen bomb is based?

A. Nuclear fission

B. Nuclear fusion

C. Artificial radioactivity

D. Natural radioactivity

Answer

30. In the combustion of 2.0 g of methane, 25 kcal heat is liberated, heat of combustion of methane would be

    A. 100 kcal

    B. 200 kcal

    C. 300 kcal

    D. 400 kcal

    Answer

31. In the chemical reaction,

    $Cl_2 + H_2S \rightarrow 2HCl + S$.

    The oxidation number of sulphur changes from

    A. 0 to 2

    B. 2 to 0

    C. -2 to 0

    D. -2 to -1

    Answer

32. What is the oxidation number of chromium in potassium dichromate?

    A. +2

    B. +3

    C. +6

    D. -4

    Answer

33. In the reaction,

    $3Mg + N_2 \rightarrow Mg_3N_2$

    A. magnesium is reduced

    B. magnesium is oxidised

    C. nitrogen is oxidised

    D. None of the above

    Answer

34. With the increase in atomic weights, melting points of the alkali metals

    A. increase

    B. decrease

    C. remain constant

    D. do not show definite trend

    Answer

35. Alkali metals in each period have

    A. smallest size

    B. owest ionization potential

    C. highest ionisation potential

D. highest electronegativity

Answer

36. In potassium manganate, the oxidation state of manganese is

A. +5

B. +6

C. +7

D. +8

Answer

37. Ferric ion forms a Prussian blue coloured precipitate due to formation of

A. $K_4[Fe(CN)_6]$

B. $Fe_4[Fe(CN)_6]_3$

C. $Fe(CNS)_3$

D. $K_3[Fe(CN)_6]$

Answer

38. The reactivity of the alkali metal sodium with water, is made use of

A. in drying of alcohols

B. in drying of benzene

C. in drying of organic amines

D. as a general drying agent

Answer

39. The bleaching action of the bleaching powder is due to the liberation of

A. chlorine

B. molecular oxygen

C. nascent oxygen

D. calcium carbonate

Answer

40. Al^{3+}, Fe^{3+}, Zn^{2+} and Ni^{2+} ions are present in an acidic solution. Excess of ammonium chloride solution followed by addition of ammonium hydroxide solution. The available precipitate will contain

A. $Zn(OH)_2$ and $Ni(OH)_2$

B. $Al(OH)_2$ and $Fe(OH)_3$

C. $Zn(OH)_2$ and $Al(OH)_3$

D. $Ni(OH)_2$ and $Fe(OH)_3$

Answer

41. How many isomeric butanes are there?

A. 2

B. 3

C. 4

D. 5

Answer

42. Which of the following will show geometrical isomerism?

    A. 1-butene

    B. 2-butene

    C. 2-methyl propene

    D. Propene

    Answer

43. Calcium carbide reacts with water to produce

    A. methane

    B. ethane

    C. ethylene

    D. acetylene

    Answer

44. Aromatic properties of benzene are proved by

    A. aromatic sextet theory

    B. resonance theory

    C. molecular orbital theory

    D. All of the above

    Answer

45. Marsh gas primarily contains

    A. C_2H_2

    B. CH_4

    C. H_2S

    D. CO

    Answer

46. *n*-propyl alcohol and *iso*-propyl alcohol are examples of

    A. position isomerism

    B. chain isomerism

    C. tautomerism

    D. geometrical isomerism

    Answer

47. Optical isomerism is shown by

    A. butanol-1

    B. butanol-2

    C. butene-1

    D. butene-2

    Answer

48. Heating together of sodium ethoxide and ethyl iodide wll give

A. ether
B. ethyl alcohol
C. acetaldehyde
D. acetic acid

Answer

49. Benzene hexachloride is used as
    A. dye
    B. antimalarial drug
    C. antibiotic
    D. insecticide

Answer

50. One mole of a solute A is dissolved in a given volume of a solvent. The association of the solute takes place according to $nA \rightleftharpoons [A]_n$. The van't Hoff factor (i) is expressed as:
    A. i = 1 - x
    B. i = 1 + xn
    C. i = 1 - x + xn1
    D. i = 1

Answer

51. Freezing point of water is 0°C. At what temperature will one molal solution of NaCl freeze if NaCl is taken to be completely dissociated (molal depression constant of water = 1.86)?
    A. -3.72°C
    B. -1.86°C
    C. 0°C
    D. 3.72°C

Answer

52. Structure of NaCl crystal is
    A. tetragonal
    B. cubic
    C. orthorhombic
    D. monoclinic

Answer

53. Bravais lattices are of
    A. 8 types
    B. 12 types
    C. 14 types
    D. 9 types

Answer

54. Point defects are present in
    A. ionic solids

B. molecular solids
C. amorphous solids
D. liquids

Answer

55. The half-life of a radioactive element is 30min, one sixteenth of original quantity of element will remain unchanged after
    A. 1 h
    B. 16 h
    C. 4 h
    D. 2 h

Answer

56. If the amount of radioactive substance is increased three times, the number of atoms disintegrated per unit time would
    A. be double
    B. be triple
    C. remain one third
    D. not change

Answer

57. Half-life of a radioactive element is 100yr. The time in which it disintegrates to 50% of its mass, will be
    A. 50 yr
    B. 200 yr
    C. 100 yr
    D. 25 yr

Answer

58. 120 gm urea is present in 5 L solution, the active mass of urea is
    A. 0.2
    B. 0.06
    C. 0.4
    D. 0.08

Answer

59. The term (dc/dt)in a rate equation refers to the
    A. concentration of the reactant
    B. decreases in concentration of the reactant with time
    C. increase in concentration of the reactant with time
    D. velocity constant of the reaction

Answer

60. If the rate expression for a chemical reaction is given by rate = $k[A]^m[B]^n$
    A. the order of the reaction is m

B. the order of the reaction is n

C. the order of the reaction is m + n

D. the order of the reaction is m- n

Answer

61. Unit of first order rate constant is

A. mol L s

B. mol^{-1} L^{-1} s^{-1}

C. mol L^{-1} s^{-1}

D. s^{-1} or min^{-1}

Answer

62. The size of colloidal particles is in between

A. 10^{-7} - 10^{-9} cm

B. 10^{-9} - 10^{-11} cm

C. 10^{-5} - 10^{-7} cm

D. 10^{-2} - 10^{-3} cm

Answer

63. The stability of lyophilic colloids is due to which of the following?

A. Charge on their particles

B. Large size of their particles

C. Smaller size of their particles

D. A layer of medium of dispersion on their particles

Answer

64. Milk is

A. fat dispersed in water

B. water dispersed in fat

C. water dispersed in oil

D. fat dispersed in fat

Answer

65. Which of the following is not an ore of lead?

A. Galena

B. Anglesite

C. Calamine

D. Cerrusite

Answer

66. An example of halide ores is

A. galena

B. bauxite

C. cinnabar

Answer

67. After partial roasting the sulphide of copper is reduced by

    A. reduction by carbon

    B. electrolysis

    C. self-reduction

    D. cyanide process

Answer

68. The brass is an alloy of

    A. gold and copper

    B. silver and zinc

    C. copper and zinc

    D. copper and aluminium

Answer

69. Which of the following transition metals shows the highest oxidation state?

    A. Sc

    B. Ti

    C. Mn

    D. Zn

Answer

70. Which of the following is the anhydride of nitric acid?

    A. NO

    B. NO_2

    C. N_2O_3

    D. N_2O_5

Answer

71. In the following reaction,

    $P_4 + 3NaOH + 3H_2O \rightarrow PH_3 + 3NaH_2PO_2$

    A. phosphorus is oxidised

    B. phosphorus is oxidised and reduced

    C. phosphorus is reduced

    D. sodium is oxidised

Answer

72. Fluorine forms chemical compounds with

    A. He

    B. Ne

    C. Ar

    D. Xe

Answer

73. The passivity of iron in concentrated nitric acid is due to
    A. ferric nitrate coating on the metal
    B. ammonium nitrate coating on the metal
    C. a thin oxide layer coating on the metal
    D. a hydride coating on the metal

Answer

74. Which type of isomers are $[Co(NH_3)_5Br]SO_4$ and $[Co(NH_3)_5SO_4]Br$?
    A. Hydrate isomers
    B. Ionisation isomers
    C. Ligand isomers
    D. Coordination isomers

Answer

75. Correct IUPAC nomeclature of $K_4[Fe(CN)_6]$ is
    A. tetra potassium ferrous cyanide
    B. potassium ferri cyanide
    C. potassium ferrocyanide
    D. potassium hexacyanoferrate (II)

Answer

76. Which of the following ions forms most stable complex compound?
    A. Cu^{2+}
    B. Ni^{2+}
    C. Fe^{2+}
    D. Mn^{2+}

Answer

77. Pb^{2+}, Cu^{2+}, Zn^{2+} and Ni^{2+} ions are present in a given acidic solution. On passing hydrogen sulphide gas through this solution the available precipitate will contain
    A. PbS and NiS
    B. PbS and CuS
    C. CuS and ZnS
    D. CuS and NiS

Answer

78. To an acid solution of an anion a few drops of $KMnO_4$ solution are added. Which of the following, if present will not decolourise the $KMnO_4$ soltuion?
    A. NO2-
    B. S^{2-}
    C. Cl^-
    D. CO32-

Answer

79. Phosgene is common name of

A. carbon dioxide and phosphene

B. phosphoryl chloride

C. carbonyl chloride

D. carbon tetrachloride

Answer

80. Which of the following does not contain -COOH group?

A. Citric acid

B. Lactic acid

C. Malanie acid

D. Picric acid

Answer

81. Which of the following is produced when acetylene is passed in dilute H_2SO_4 in the presence of $HgSO_4$?

A. C_2H_5OH

B. CH_3COCH_3

C. CH_3CHO

D. Mercury carbide

Answer

82. C_2H_5OH can be differentiated from CH_3OH by

A. reaction with HCl

B. reaction with NH_3

C. by iodoform test

D. by solubility in water

Answer

83. The reaction between an alcohol and an acid is called

A. esterification

B. saponification

C. hydrolysis

D. hydrogenation

Answer

84. Dehydration of glycerol gives

A. propane

B. propene

C. acrolein

D. benzene

Answer

85. The reaction between an alkyl halide and sodium metal in dry ether is called

A. Clemmensen reduction

B. Kolbe's reaction

C. Wurtz's reaction

D. Cannizaro's reaction

Answer

86. Acid hydrolysis of methyl isocyanide gives

A. CH_3NH_2 + HCOOH

B. CH_3NH_2 + CH_3COOH

C. CH_3NH_2 + CH_3CH_2COOH

D. CH_3NH_2 + $(CH_3)_2CHCOOH$

Answer

87. The acid present in vinegar is

A. CH_3COOH

B. H_2SO_4

C. HCl

D. HNO_3

Answer

88. Mark the correct statement.

A. Methyl amine is acidic.

B. Methyl amine is less basic than NH_3.

C. Methyl amine is a stronger base than NH_3.

D. Methyl amine forms salts with bases.

Answer

89. Hydrolysis of acetamide gives

A. acetic acid

B. acetaldehyde

C. methyl amine

D. formic acid

Answer

90. Which one of the following reagents can distinguish between an aldehyde and a ketone?

A. Fehling's solution

B. H_2SO_4 solution

C. $NaHSO_4$

D. NH_3

Answer

91. Dry distillation of the mixture of calcium formate and calcium acetate gives

A. acetone

B. acetaldehyde

C. formaldehyde

D. formic acid

Answer

92. Which one of the following will react with acetamide to give methyl amine?

A. PCl_5

B. $NaOH + Br_2$

C. Soda lime

D. H_2SO_4

Answer

93. The general formula $(RCO)_2O$ represents

A. a ketone

B. an ether

C. an acid anhydride

D. an ester

Answer

94. Which of the following is an example of condensation polymers?

A. Polythene

B. PVC

C. Orlon

D. Terylene

Answer

95. Natural rubber is formed by polymerisation of which of the following?

A. Phenol

B. Isoprene

C. Chloroprene

D. Styrene

Answer

96. Which of the following is the thermosetting plastic?

A. Nylon

B. Bakelite

C. Polythene

D. Polystyrene

Answer

97. Carbohydrates are stored in human body as

A. glucose

B. glycogen

C. starch

D. fructose

Answer

98. DNA contains the sugar
    A. Deoxyribose
    B. Ribose
    C. D-fructose
    D. D-glucose

Answer

99. The helical structure of proteins is stabilised by
    A. peptide bonds
    B. dipeptide bond
    C. hydrogen bond
    D. van der Waal's forces

Answer

100. Proteins are hydrolysed by enzymes to give
    A. dihydroxy acids
    B. amino acids
    C. amines
    D. carboxylic acids

Answer