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CHEMISTRY

BOOKS - KALYANI CHEMISTRY (ENGLISH)

SAMPLE PAPER 01

Questions

1. Arrange the types of arrangement in terms of decreasing packing efficiency.

A. BCC $>$ Simple cubic $>$ CCP

B. $HCP > CCP > B\mathbb{C}$

C. $HCP > BCC >$ Simple cubic

D. $CCP > BCC > HCP$

Answer: C

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2. Of the following terms used for denoting concentration of a solution, the one which does not get affected by temperature is

A. Molarity

B. Molality

C. Normality

D. Formality

Answer: B

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3. Electrolysis involves oxidation and reduction respectively at:

A. Anode and cathode

B. Cathode and anode

C. At both the electrode

D. None of these

Answer: A

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4. Purest form of iron is

A. Cast iron

B. Hard Steel

C. Stainless steel

D. Wrought iron

Answer: A

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5. Which of the following mainly exhibits (-2) oxidation state ?

A. S

B. O

C. Se

D. Te

Answer: B

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6. Carbylamine test involves heating a mixture of:

A. Alcoholic KOH, methyl iodide, and sodium metal

B. Alcoholic KOH, methyl iodide, and primary amine

C. Alcoholic KOH, chloroform, and primary amine

D. Alcoholic KOH, methyl alcohol, and primary amine

Answer: C

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7. The ionization constant of phenol is higher than that of ethanol because

A. Phenoxide ion is a stronger base than ethoxide ion

B. Phenoxide ion is stabilised through delocalisation

C. Phenoxide ion is less stable than ethoxide ion

D. Phenoxide ion is bulkier than ethoxide ion

Answer: B

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8. Which of the following is most acidic ?

A. H_2O

B. CH_3OH

C. C_2H_5OH

D. $CH_3CH_2CH_2OH$

Answer: A

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9. When chloroform is heated with aqueous NaOH, it gives :

A. Formic acid

B. Sodium formate

C. Acetic acid

D. Sodium acetate

Answer: B

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10. Which of the following is not an interhalogen compound ?

A. ICl_4^-

B. ClF_5

C. IPO_4

D. ClF_3

Answer: C

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11. Which one of the following ores is best concentrated by froth floatation method?

A. Magnetite

B. Cassiterite

C. Galena

D. Malachite

Answer: C

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12. Give hydrolysis products of boron trichloride.

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13. Electrochemical equivalent is the amount of substance which gets deposited from its solution on passing electrical charge equal to :

A. 96,500 coulomb

B. 1 coulomb

C. 60 coulomb

D. 965 coulomb

Answer: A

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14. A solution that obeys Raoult's law is:

A. Normal solution

B. Molar solution

C. Ideal solution

D. Saturated solution

Answer: C

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15. A substance A_XB_Y crystallises in a face centred cubic (fcc) lattice in which atoms 'A' occupy each corner of the cube and atoms 'B' occupy the centres of each face of the cube. Identify the correct composition of the substance A_XB_Y :

A. AB_3

B. A_4B_3

C. A_3B

D. Composition cannot be specified

Answer: A

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16. In a rock salt structure each Cl^- ion is surrounded by:

A. $4Na^+$ ions

B. $6Na^+$ ions

C. $8Na^+$ ions

D. $12Na^+$ ions

Answer: B

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17. Determination of correct molecular mass from Raoult's law is applicable to :

A. An electrolyte in solution

B. A non-electrolyte in dilute solution

C. A non-electrolyte in conc. Solution

D. An electrolyte in a liquid solvent.

Answer: B

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18. Which of the following aqueous solutions should have the highest boiling point ?

A. $1.0MNaOH$

B. $1.0MNa_2SO_4$

C. $1.0MNH_4NO_3$

D. $1.0MKNO_3$

Answer: B

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19. The standard electrode potentials of four elements A, B, C and D are $-3.05, 1.66, -0.40$ and 0.80 volts respectively. The highest chemical activity will be shown by:

A. A

B. B

C. C

D. D

Answer: A

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20. Heating mixture of Cu_2O and Cu_2S will give

A. $Cu + SO_2$

B. $Cu + SO_3$

C. $CuO + CuS$

D. Cu_2SO_3

Answer: A

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21. The high viscosity and high boiling point of HF is due to :

A. Low dissociation energy of F_2 molecule

B. Associated nature due to hydrogen bonding

C. Ionic character of HF

D. High electronegativity of fluorine

Answer: B

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22. Phenol when treated with excess of bromine water gives a white precipitate of

A. m-bromophenol

B. o-and p-bromophenol

C. 2,4-dibromophenol

D. 2, 4, 6-tribromophenol

Answer: D

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23. Shape of ClF_3 is :

A. Trigonal planar

B. Tetrahedral

C. T-Shaped

D. Distorted octahedral

Answer: C

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24. Which of the following compound has been suggested as causing depletion of the ozone layer in the upper stratosphere?

A. CH_4

B. CCl_2F_2

C. CF_4

D. CH_2Cl_2

Answer: B

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25.

$$Zn\left|Zn^{2+}(a=0.1M)\right| \mid Fe^{2+}(a=0.01M)Fe.$$

The EMF of the above cell is 0.2905. The equilibrium constant for the cell reaction is

A. $10^{0.32 / 0.0991}$

B. $10^{0.32 / 0.0295}$

C. $10^{0.26 / 0.0295}$

D. $e^{0.32 / 0.295}$

Answer: B

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26. Which of the following 0.1M aqueous solution will have the lowest freezing point?

A. Potassium sulphate

B. Sodium chloride

C. Urea

D. Glucose

Answer: A

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27. Which of the following is an example of a non-ideal solution showing positive deviation?

A. Acetone + Carbon disulphide

B. Chlorobenzene + Bromobenzene

C. Chloroform + Benzene

D. Acetone + Aniline

Answer: A

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28. Copper has the face centred cubic structure. The coordination number of each ion is:

a) 4

b) 12

c) 14

d) 8

A. 4

B. 12

C. 14

D. 8

Answer: B

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29. Gold (atomic mass 197 u) crystallises in a face-centred unit cell. What is its atomic radius if the edge length of the gold unit cell is $0.407x10^{-9}$m?

A. 0.115nm

B. 0.144nm

C. 0.235nm

D. 0.156nm

Answer: B

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30. Molar conductivities of the weak electrolyte at infinite dilution is evaluated through:

A. Kohlrausch Law

B. Ostwald dilution

C. Arrhenius Concept

D. none of these

Answer: A

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31. The limiting molar conductivities Λ^{o} for NaCl, KBr and KCl are 126, 152 and

$150 Scm^2 mol^{-1}$ respectively. The $\wedge^o$ for NaBr is:

A. $128 Scm^2 mol^{-1}$

B. $278 Scm^2 mol^{-1}$

C. $976 Scm^2 mol^{-1}$

D. $302 Scm^2 mol^{-1}$

Answer: A

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32. When an atom has 'N' octahedral voids, the number of tetrahedral voids are:

A. 8N

B. 1/2N

C. 6N

D. 2N

Answer: D

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33. The number of tetrahedral voids in the unit cell of a face centred cubic lattice of similar atoms is

A. 6

B. 8

C. 4

D. 2

Answer: B

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34. Which of the following element has highest Ionization enthalpy?

A. As

B. Sb

C. P

D. N

Answer: D

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35. Which element possess highest electron gain enthalpy in the periodic table?

A. F

B. Cl

C. Br

D. I

Answer: B

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36. Molar conductivity of 0.15 M solution of KCI at 298 K, if its conductivity is 0.0152 S cm^{-1} will be

A. $124\Omega^{-1}cm^2mol^{-1}$

B. $204\Omega^{-1}cm^2mol^{-1}$

C. $101\Omega^{-1}cm^2mol^{-1}$

D. $300\Omega^{-1}cm^2mol^{-1}$

Answer: C

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37. Electrical conductance through metals is called metallic or electronic conductance and is due to the movement of electrons. The electronic conductance depends on:

A. The nature and structure of the metal

B. The number of valence electrons per atom

C. Change in temperature

D. All of these

Answer: D

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38. AgCl is crystallized from molten AgCl containing a little $CdCl_2$. The solid obtained will have

A. Cationic vacancies equal to number of Cd^{2+} ions incorporated

B. Cationic vacancies equal to double the number of Cd^{2+} ions

C. Anionic vacancies

D. Neither cationic nor anionic vacancies.

Answer: A

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39. Which of the following exhibit both Frenkel & Schottky defect?

A. AgCl

B. KCl

C. AgBr

D. NaCl

Answer: A

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40. Partial pressure of a solution component is directly proportional to its mole fraction. This is known as

A. Henry's law

B. Raoult's law

C. Distribution law

D. Ostwald's dilution law

Answer: B

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41. The relative lowering in vapour pressure is proportional to the ratio of number of

A. Solute molecules to solvent molecules

B. Solvent molecules to solute molecules

C. Solute molecules to the total number of molecules in solution

D. Solvent molecules to the total number of molecules in solution

Answer: C

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42. Faraday's laws of electrolysis are related to the :

A. Atomic number of cation

B. Speed of cation

C. Speed of anion

D. Equivalent weight of electrolyte

Answer: D

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43. How much electricity in terms of Faraday is required to produce 100 g of Ca from molten $CaCl_2$?

A. 1F

B. 2F

C. 3F

D. 5F

Answer: D

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44. A dihalogen derivative (A) of a hydrocarbon having two carbon atoms reacts with alcoholic potash and forms another

hydrocarbon which gives a red precipitate with ammoniacal cuprous chloride. Compound A gives an aldehyde when treated with aqueous KOH. Write down the name and formula for the organic compound.

A. Dichloroethane

B. Dibromoethane

C. Diiodoethane

D. Difluoroethane

Answer: A

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45. A dihalogen derivative (A) of a hydrocarbon having two carbon atoms reacts with alcoholic potash and forms another hydrocarbon which gives a red precipitate with ammoniacal cuprous chloride. Compound A gives an aldehyde when treated with aqueous KOH. Write down the name and formula for the organic compound.

A. Propanal

B. Methanal

C. Ethanal

D. None of the above

Answer: C

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46. Arrange the following in decreasing Lewis acid strength -PF_3, PCl_3, PBr_3, Pl_3

A. $Pl_3 > PBr_3 > PCl_3 > PF_3$

B. $PF_3 > PCl_3 > PBr_3 > Pl_3$

C. $PCl_3 > PBr_3 > Pl_3 > PF_3$

D. $PBr_3 > Pl_3 > PF_3 > PCl_3$

Answer: A

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47. Arrange the following hydrides of group 16 elements in order of increasing stability.

A. $H_2S < H_2O < H_2Te > H_2Se$

B. $H_2O < H_2Te < H_2Se < H_2S$

C. $H_2O < H_2S < H_2Se < H_2Te$

D. $H_2Te < H_2Se < H_2S < H_3O$

Answer: D

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48. The significance of leaching in the extraction of aluminium is

A. It helps removing the impurities like SiO_2, Fe_2O_3 etc. from the bauxite ore

B. It converts the ore into oxide

C. It reduces melting point of the ore

D. It eliminates water from bauxite

Answer: A

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49. Which of the following metals cannot be obtained by reduction of its metal oxide by aluminium?

A. Cr

B. Mn

C. Fe

D. Mg

Answer: D

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50. The density of a metal which crystallises in bcc lattice with unit cell edge length 300 pm and molar mass 50 g mol^{-1} will be:

A. $10gcm^{-3}$

B. $14.2gcm^{-3}$

C. $6.15gcm^{-3}$

D. $9.32gcm^{-3}$

Answer: C

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51. Which of the following will have metal deficiency defect?

A. NaCl

B. FeO

C. KC

D. ZnO

Answer: B

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52. A compound(A) reacts with thionyl chloride to give compound (B). (B) reacts with magnesium to form Grignard reagent which is treated with acetone and the product is hydrolysed to give 2-methyl-2-butanol.

What is(A) compound?

A. Butanol

B. Propanol

C. Methanol

D. Ethanol

Answer: D

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53. A compound (X) reacts with thionyl chloride to give a compound (Y) , (Y) reacts with Mg to form a Grignard reagent , which is treated with acetone and the product is hydrolysed to give 2-methyl-2- butanol. What are structural formulae of (X) and (Y) ?

A. Butyl chloride

B. Propyl chloride

C. Ethyl chloride

D. Methyl chloride

Answer: C

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54. Give hydrolysis products of diborone.

A. 2-Butanol

B. Diethylether

C. 2-Butanal

D. None of these

Answer: A

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55. A compound (A) with molecular formulae $C_4H_{10}O$ on oxidation form compound (B). The compound (B) gives positive iodoform test and on reaction with CH_3MgBr followed by

hydrolysis gives (C),

The compound C is:

A. 2-methyl-2 butanol

B. 2-methyl butan-3-ol

C. 3-methyl butan-2-ol

D. Pentanol

Answer: A

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56. During the process of electrolytic refining of copper some metals present as impurity settle as 'anode mud'. These are

A. Pb and Zn

B. Sn and Ag

C. Fe and Ni

D. Ag and Au

Answer: D

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57. Extraction of zinc from zinc blende is achieved by

A. Electrolytic reduction

B. Roasting followed by reduction with carbon

C. Roasting followed by reduction with another metal

D. Roasting followed by self-reduction

Answer: B

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58. In a simple cubic, body-centred cubic and face-centred cubic structure, the ratio of the number of atoms present is respectively

A. $8:1:6$

B. $1:2:4$

C. $4:2:1$

D. $4:2:3$

Answer: B

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59. Na and Mg crystallize in bcc- and fcc-type crystals, respectively, then the number of atoms of Na and Mg present in the unit cell of their respective crystal is

A. 4 and 2

B. 9 and 14

C. 14 and 9

D. 2 and 4

Answer: D

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60. S-S bond is present in which of the ion pairs?

A. $S_2O_7^{2-}$, $S_2O_3^{2-}$

B. $S_4O_6^{2-}$, $S_2O_7^{2-}$

C. $S_2O_7^{2-}$, $S_2O_8^{2-}$

D. $S_4O_6^{2-}$, $S_2O_3^{2-}$

Answer: D

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61. P_4O_{10} has _____bridging O atoms.

A. 4

B. 5

C. 6

D. 2

Answer: C

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62. C-Cl bond of chlorobenzene in comparison to C-Cl bond in methyl chloride is

A. Longer and weaker

B. Shorter and weaker

C. Shorter and stronger

D. Longer and stronger

Answer: C

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63. Identify the reagent used in the following chemical reaction to for a diazonium salt.

A. NaBr

B. HBr

C. HCl

D. Cu_2Br_2

Answer: B

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64. What should be the correct IUPAC name for diethylbromomethane?

A. 1-Bromo-1,1-diethylmethane

B. 3-Bromopentane

C. 1-Bromo-1-ethylpropane

D. 1-Bromopentane

Answer: A

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65. Molecules whose mirror image is non-superimposable over them are known as chiral. Which of the following molecules is chiral in nature?

A. 2-Bromobutane

B. 1-Bromobutane

C. 2-Bromopropane

D. 2-Bromopropan-2-ol

Answer: A

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66. Assertion: 2,4-Dinitrophenol is less acidic than phenol

Reason: Lower alcohols are more soluble in water than higher alcohols

A. Assertion is false but reason is true

B. Assertion is true but reason is false

C. Both assertion and reason are true, but reason is not a true explanation for

assertion

D. Both assertion and reason are true and reason is the correct explanation for assertion

Answer: B

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67. Assertion (A) Nitration of chlorobenzene leads to the formation of m-nitrochlorobenzene.

Reason (R) $-NO_2$ group is a m-directing group.

A. Assertion is false but reason is true

B. Assertion is true but reason is false

C. Both assertion and reason are true, but reason is not a true explanation for assertion

D. Both assertion and reason are true and reason is the correct explanation for assertion

Answer: A

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68. Assertion : The heavier p-block element do not form strong π bonds.

Reason : The heavier elements of p-block form $d\pi - p\pi$ or $d\pi - d\pi$ bonds

A. Assertion is false but reason is true

B. Assertion is true but reason is false

C. Both assertion and reason are true, but reason is not a true explanation for assertion

D. Both assertion and reason are true and reason is the correct explanation for assertion

Answer: D

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69. Assertion: Bond angle of H_2S is smaller than H_2O.

Reason: Electronegativity of the central atom increases, bond angle decreases.

A. Assertion is false but reason is true

B. Assertion is true but reason is false

C. Both assertion and reason are true, but reason is not a true explanation for assertion

D. Both assertion and reason are true and reason is the correct explanation for assertion

Answer: B

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70. Assertion: Limestone is added to blast furnace during extraction of iron.

Reason: Limestone decomposes to calcium oxide and carbon dioxide.

A. Assertion is false but reason is true

B. Assertion is true but reason is false

C. Both assertion and reason are true, but reason is not a true explanation for assertion

D. Both assertion and reason are true and reason is the correct explanation for assertion

Answer: C

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