



CHEMISTRY

BOOKS - KALYANI CHEMISTRY (ENGLISH)

SAMPLE PAPER 2 (CHEMISTRY)

Questions

1. Select the correct alternative from the choices given:

The packing efficiency of simple cubic structure, body centered cubic structure and face centered cubic structure respectively is :

A. 52.4%, 74%, 68%

B. 74%, 68%, 52.4%

C. 52.4%, 68%, 74%

D. 68%, 74%, 52.4%

Answer: C



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2. Molecular weight of non-volatile solute can be determined by:

- A. Victor-Mayer's method
- B. Graham's law of diffusion
- C. Gay Lussac's law
- D. Raoult's law

Answer: D



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3. Conductivity of a solution is directly proportional to:

A. Dilution

B. Number of ions

C. Current density

D. Volume of the solution

Answer: B



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4. The process of zone refining is used in the purification of:

A. Al

B. Ge

C. Cu

D. Ag

Answer: B



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5. Aqua regia is a mixture of

A. Conc. HNO_3 and conc. H_2SO_4

B. Conc. HCl and conc. H_2SO_4 in the ratio
of 3:1

C. Conc. HCl and conc. HNO_3 in the ratio
of 3:1

D. None of these

Answer: C



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6. Alkyl halides undergo :

A. Electrophilic substitution reactions

B. Electrophilic addition reactions

C. Nucleophilic substitution reactions

D. Nucleophilic addition reactions

Answer: C



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7. The correct order of boiling points for primary (1°), secondary (2°) and tertiary alcohol (3°) is:

A. $1^\circ > 2^\circ > 3^\circ$

B. $3^\circ > 2^\circ > 1^\circ$

C. $2^\circ > 1^\circ > 3^\circ$

D. $2^\circ > 3^\circ > 1^\circ$

Answer: A



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8. Phenol is heated with $CHCl_3$ and alcoholic KOH when salicylaldehyde is produced. This reaction is known as :

- A. Rosenmund's reaction
- B. Reimer-Tiemann reaction
- C. Friedel-Craft's reaction
- D. Sommelet reaction

Answer: B



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9. Halogenation of alkane gives :

A. Only required alkyl halide

B. Alkyl halide and unreacted halogen

C. A mixture of mono-, di-, tri- and tetra-
halogen derivatives

D. Alkyl halide and unreacted alkane

Answer: C



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10. The geometry of XeF_6 molecule and the hybridization of Xe atom in the molecule is :

A. Distorted octahedral and sp^3d^3

B. Square planar and sp^3d^2

C. Pyramidal and sp^3

D. Octahedral and sp^3d^3

Answer: A



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11. In the alumino-thermite process, Al acts as :

A. Reducing agent

B. Oxidising agent

C. Catalyst

D. Electrolyte

Answer: A



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12. The cell reaction as written is spontaneous if the cell potential is:

- A. Positive
- B. Negative
- C. Zero
- D. Infinite

Answer: A



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13. For a dissociated solute in solution, the value of van't Hoff factor is :

1) zero

2) one

3) greater than one

4) less than one

A. Zero

B. One

C. Greater than one

D. Less than one

Answer: C



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14. How many kinds of space lattices are possible in a crystal?

A. 23

B. 7

C. 30

D. 14

Answer: D



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15. Which one is called oleum?

A. Liq. NH_3

B. $H_2SO_4 + SO_3$

C. Conc. HNO_3

D. Dilute solution of H_2O_2

Answer: B



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16. In the extraction of chlorine by electrolysis of brine

A. Oxidation of Cl^- ion occur to chlorine gas

B. Reduction of Cl^- ion occur to chlorine gas

C. For overall reaction ΔG° has negative value

D. A displacement reaction takes place

Answer: A



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17. The number of moles of solute present in 1000 gm of the solvent is known as:

A. Molarity

B. Molality

C. Normality

D. Mole fraction.

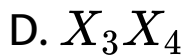
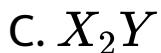
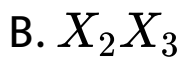
Answer: B



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18. In a compound, atoms of the element Y form ccp lattice and those of the element X occupy $2/3rd$ of tetrahedral voids. The formula of the compound will be :

A. X_4Y_3



Answer: A



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19. The quantity of electricity required to deposit $1.15g$ of sodium from molten $NaCl$ ($Na = 23$, $Cl = 35.5$) is

A. 1F

B. 0.5F

C. 0.05F

D. 1.5F

Answer: C



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20. The reaction in presence of dry ether,



example of:

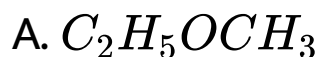
- A. The Wurtz reaction
- B. Sandmeyer's reaction
- C. Aldol condensation
- D. Williamson's reaction

Answer: A



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21. Which of the following is simple ether ?



B. CH_3OCH_3

C. $C_6H_5OCH_3$

D. All of these

Answer: B



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22. Which of the following alcohol is least soluble in water?

A. n-Butyl alcohol

B. Iso-Butyl alcohol

C. Tert-Butyl alcohol

D. Sec-Butyl alcohol

Answer: A



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23. Which ore contains both iron and copper ?

A. Cuprite

B. Chalcocite

C. Malachite

D. Copper pyrites

Answer: D



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24. The osmotic pressure of a dilute solution is given by

A. $P = P_0x$

B. $\pi V = nRT$

C. $p = VRT$

D. None of these

Answer: B



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25. The unit of equivalent conductance is :

A. $ohm^{-1}cm^2equiv^{-1}$

B. $ohm^{-1}cm^2gm^{-1}$

C. $ohm cm^2equiv^{-1}$

D. $\text{ohm}^{-1}\text{mole}^{-1}$

Answer: A



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26. If a cation leaves a site in solid lattice, and is located at an interstitial position. The lattice defect is

A. Interstitial defect

B. Valency defect

C. Frenkel defect

D. Schottky defect

Answer: C



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27. In NaCl structure:

A. All octahedral and tetrahedral sites are occupied

B. Only octahedral sites are occupied

C. Only tetrahedral sites are occupied

D. Neither octahedral nor tetrahedral sites
are occupied

Answer: B



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28. Grignard's reagent is prepared by the
action of magnesium metal on:

A. Alcohol

B. Phenol

C. Alkyl halide

D. Benzene

Answer: C



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29. When ethanol reacts with PCl_5 it gives three products which include chloroethane and hydrochloric acid. What is the third product?

- A. Phosphorus acid
- B. Phosphoric acid
- C. Phosphorus trichloride
- D. Phosphoryl chloride

Answer: D



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30. Molar ionic conductivities of a bivalent electrolyte are 57 and 73. the molar conductivity of the solution will be

A. $130\text{Scm}^2\text{mol}^{-1}$

B. $65\text{Scm}^2\text{mol}^{-1}$

C. $260\text{Scm}^2\text{mol}^{-1}$

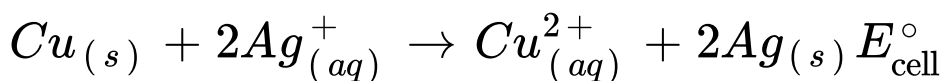
D. $187\text{Scm}^2\text{mol}^{-1}$

Answer: A



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31. In a cell reaction,



$=+0.46\text{ V}$. If the concentration of Cu^{2+} ions is doubled then E_{cell}° will be

- A. Decrease by small fraction
- B. Doubled
- C. Unchanged
- D. Decrease by small fraction

Answer: A



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32. The coordination number of a metal crystallising in a hexagonal close-packed structure is:

A. 8

B. 4

C. 6

D. 12

Answer: D



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33. The coordination number of sodium in sodium oxide is:

A. 6

B. 8

C. 4

D. 2

Answer: C



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34. Lanthanoid contraction is due to increase in

- A. Atomic radius
- B. Atomic number
- C. Shielding by 4f electrons
- D. Effective nuclear charge

Answer: D



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35. Across the lanthanide series, the basicity of the lanthanide hydroxides:

A. Increases

B. First increases then decreases

C. Decreases

D. Remain same

Answer: C



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36. In hydrogen-oxygen fuel cell, combustion of hydrogen occurs to :

A. Produce high purity water

B. Create potential difference between two electrode

C. Generates heat

D. Removes adsorbed oxygen from electrode

Answer: B



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37. The electricity needed to liberate one gram equivalent of Cu^{2+} is:

A. 1C

B. 2F

C. 96500C

D. 96500F

Answer: C



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38. The crystal system of unit cell dimensions $a=0.387$, $b=0.387$ and $c=0.504$ nm and $\alpha = \beta = 90^\circ$ and $\gamma = 120^\circ$ is

- A. Triclinic
- B. Orthorhombic
- C. Cubic
- D. Hexagonal

Answer: D



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39. Which of the following unit cells is the most unsymmetrical ?

A. Triclinic

B. Orthorhombic

C. Cubic

D. Hexagonal

Answer: A



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40. The amount of solute required to prepare 10L of decimolar solution is:

A. 0.01 mole

B. 0.2 mole

C. 0.05 mole

D. 1 mole

Answer: D



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41. Molarity of pure water is

A. 18M

B. 5.56M

C. 55.6M

D. 100M

Answer: C



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42. Specific conductance of 0.1M NaCl solution is $1.06 \times 10^{-2} \text{ ohm}^{-1} \text{ cm}^{-1}$. Its molar conductance in $\text{ohm}^{-1} \text{ cm}^2 \text{ mol}^{-1}$.

A. 1.06×10^2

B. 1.06×10^3

C. 1.06×10^4

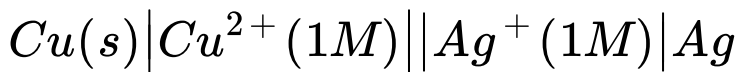
D. 53

Answer: A



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43. The emf of the cell:



is 0.46V. The standard reduction potential for

Ag^+ / Ag is 0.80V. The standard reduction

potential of Cu^{2+} / Cu is:

A. $-0.34V$

B. $1.26V$

C. $0.34V$

D. $-1.26V$

Answer: C



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44. 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. Butanol

B. Propanol

C. Methanol

D. Ethanol

Answer: C



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45. 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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46. With respect to d block elements:

The 3d block element that exhibits maximum number of oxidation states:

A. Mn

B. Sc

C. Ti

D. Zn

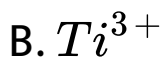
Answer: A



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47. With respect to d block elements:

Which one of the following forms a colourless solution in aq medium ?



Answer: C



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48. Smelting involves reduction of metal oxide

with:

A. Carbon

B. Carbon Monoxide

C. Magnesium

D. Aluminium

Answer: A



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49. Electromagnetic separation is used in the concentration of :

A. Bauxite

B. Copper pyrites

C. Cassiterite

D. Cinnabar

Answer: C



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50. The number of atoms in BCC arrangement is:

A. 1

B. 2

C. 8

D. 4

Answer: B



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51. In hcp arrangement, each atom at the corner contributes to the unit cell equal to

A. $1/2$

B. $1/8$

C. $1/6$

D. $1/4$

Answer: C



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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. Phenol reacts with chloroform in the presence of aq. KOH at 340 K followed by hydrolysis of the resulting product giving salicylaldehyde

The above reaction is called:

A. Reimer-Tiemann reaction

B. Wurtz Reaction

C. Fries Rearrangement

D. Kolbe's Synthesis

Answer: A



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55. Phenol reacts with chloroform in the presence of aq. KOH at 340 K followed by hydrolysis of the resulting product giving salicylaldehyde

The electrophile in this electrophilic substitution reaction is:



Answer: B



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56. Roasting results in the production of metal
in the case of:

A. Cinnabar

B. Iron pyrites

C. Bauxite

D. Galena

Answer: A



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57. During roasting of Zinc blende, it converts to:

- A. Zinc oxide
- B. Zinc Sulphate
- C. Zinc carbonate
- D. Zinc

Answer: A



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58. The appearance of colour in solid alkali metal halides is generally due to

A. Schottky defects

B. Frenkel defects

C. Interstitial effect

D. F-position

Answer: A



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59. Schottky defect in crystals is observed when

A. Density in crystal increase

B. Unequal number of cation and anion are missing from the lattice

C. Equal number of cations and anions are missing from the lattice

D. Density of the crystal is increased

Answer: B



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60. There are two series of f-block elements as 4f and 5f, hence

The atomic number of three lanthanide elements X, Y, Z are 65,68,70 respectively. The basic character of their hydroxide will decrease:

A. $X > Y > Z$

B. $Z > Y > X$

C. $Y > X > Z$

$$D. Z > X > Y$$

Answer: A



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61. There are two series of f-block elements as 4f and 5f, hence

Terbium has electronic configuration configuration $[Xe]4f^96s^2$, Oxidation state will be:

A. + 3, + 4

B. + 2, + 3, + 4

C. + 3, + 4, + 5

D. + 2, + 3, + 4, + 5

Answer: A



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62. A chloro compound(A) on reduction with Zn-Cu and ethanol give hydrocarbon (B) with 5 carbon atoms. When(A) is dissolved dry ether and treated with sodium metal it gave 2, 2, 5, 5

tetra methyl hexane. The treatment of A as A'C
(in presence of alcoholic KCN)

The compound A is:

A. 1-chloro-2,2 dimethyl propane

B. 1-chloro-2,2 dimethyl propane

C. 1-chloro-2 methyl butane

D. 2-chloro-2 methyl propane

Answer: A



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63. A chloro compound(A) on reduction with Zn-Cu and ethanol give hydrocarbon (B) with 5 carbon atoms. When(A) is dissolved dry ether and treated with sodium metal it gave 2, 2, 5, 5 tetra methyl hexane. The treatment of A as A'C (in presence of alcoholic KCN)

The reaction of A with aq. KOH will preferably favour:

A. SN_1 Mechanism

B. E_1 Mechanism

C. SN_2 Mechanism

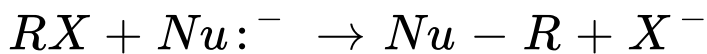
D. E_2 Mechanism

Answer: A

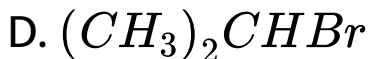
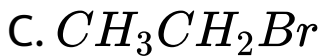
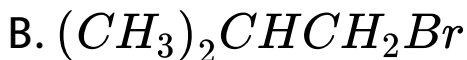
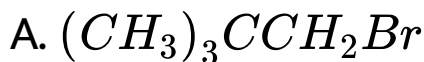


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64. Alkyl halide undergoes nucleophilic substitution reaction in which halogen atom is replaced by other atom.



Which of the following is least reactive towards SN_2 mechanism?

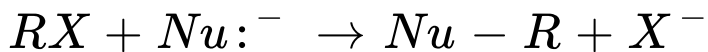


Answer: A

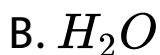


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65. Alkyl halide undergoes nucleophilic substitution reaction in which halogen atom is replaced by other atom.



Which of the following has highest nucleophilicity?



Answer: A



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66. Assertion: 1-Iodopropane and 2-Iodopropane are chain isomers

Reason: These differ in the position of Iodine in the carbon chains

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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67. Assertion: Ether molecule is linear

Reason: Ether can be prepared from alkyl halide by Wurtz reaction

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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68. Statement-1 :Xenon forms fluorides.

Statement-2 :5 d-orbitals are available in xenon for valence shell expansion.

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: Gold and platinum occur in native state.

Reason: Gold and platinum are expensive metals

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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70. Assertion: Copper glance, zinc blende and Anglesite are sulphide ores.

Reason Silica is basic flux used in metallurgy.

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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