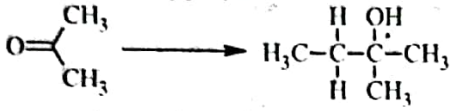
Group A: Multiple Choice Questions

Tick the correct answer. **[11×1=11]**

1. Solubility of calcium carbonate is 0.0305 g/L. K_{sp} for $CaCO_3$ is
   a. 0.000305 b. 193×10^{-8}
   c. 9.3×10^{-8} d. 93.05×10^{-5}
2. For the reaction $2N_2O_5 \longrightarrow 4NO_2 + O_2$. The rate of reaction is
   a. $\frac{1d}{2dt}[N_2O_5]$ b. $2\frac{d}{dt}[N_2O_5]$
   c. $\frac{1d}{4dt}[NO_2]$ d. $4\frac{d}{dt}[NO_2]$
3. What is the concentration of the sulphuric acid solution, if 100 mL of the solution is neutralised by 50 mL of 0.5 M $Ba(OH)_2$ solution?
   a. 0.25 M b. 50 M
   c. 0.5 M d. 100 M
4. If $E°_{Fe^{2+}/Fe} = -0.441$ V and $E°_{Fe^{3+}/Fe^{2+}} = 0.771$ V, the standard EMF of the reaction, $Fe + 2Fe^{3+} \longrightarrow 3Fe^{2+}$ will be
   a. 1.212V b. 0.111V
   c. 0.330V d. 1.653V
5. Transition elements exhibit variable valency because they release electrons from
   a. ns orbitals b. np orbitals
   c. (n-1)d orbitals d. (n-1)d & ns orbitals
6. For which of the following ores froth floatation method is used for concentration?
   a. Haematite b. Zinc blende
   c. Magnetite d. Camallite

7. Reduction of aromatic nitro compounds using Fe and HCl gives....
   a. Aromatic oxime b. Aromatic hydrocarbon
   c. Aromatic primary amine d. Aromatic amide
8. Which of the following reaction sequence that will best carry out the following preparation?



   a. i. I + MeONa + CH_3H_2Br
      ii. neutralize
   b. i. I + EtONa
      ii. CH_3CH_2Br
      iii. neutralize
   c. i. CH_3CH_2Br + Mg, Et_2O
      ii. Add I
      iii. neutralize
   d. i. I + CH_3CH_2OH + Mg
      ii. neutralize
9. In radioactive decay, electron is emitted from
   a. nucleus of atom
   b. inner orbit or atom
   c. outermost orbit of atom
   d. orbit with principal quantum number
10. ..... pulp slurries at 3 percent consistency don't even flow well. Therefore, the entire purpose of the paper machine is to remove all of this water that one is forced to use to give paper that's uniform.
    a. Softwood b. Groundwood
    c. Hardwood d. Beetewood
11. What is released during the production of clinker?
    a. $CaCO_3$ b. CO_2
    c. $Ca(OH)_2$ d. CO

Group B: Short Answer Questions

Attempt all the questions. **[8×5=40]**

1. a. 3.15 g of an acid HX was dissolved in water and its solution made to 250 cc. If 30.2 cc of this acid solution neutralized 25 cc of 0.115 M KOH, calculate.
      i. Molarity of HX. [1]
      ii. Molecular weight of HX. [1]
      iii. Name of radical X [1]
   b. What volume of water must be added to 70 mL of 0.5N acid solution in order to make it exactly decinormal? [2]

   OR

   a. Determine the rate law for the reaction 2A + B ⟶ product from the following data
      i. On the doubling initial concentration of both A and B, the reaction rate becomes 32 times. [2]
      ii. On doubling the concentration of B keeping that of A fixed, the reaction rate becomes 4 times. [2]
   b. What is meant by instantaneous rate of reaction? [1]
2. a. The latent heat of fusion of ice is 336 Jg^{-1}. Calculate the molar entropy of fusion of ice at its normal melting point. [2]
   b. The standard enthalpy of formation of:

H_2O	-286 kJ
CO_2	-393.5 kJ
C_6H_6	+49.02 kJ

   Calculate the standard enthalpy of combustion of C_6H_6. [3]
3. a. Zn^{+2} salts are white while Cu^{+2} salts are coloured, Why? [2]
   b. Why do transition elements show variable oxidation states? In 3d series (Sc to Zn), which element shows the maximum number of oxidation states and why? [2]
   c. How would you account for transition metals and their compounds show catalytic properties? [1]
4. a. Out of C and CO, which is a better reducing agent at the lower temperature range in the blast furnace to extract iron from the oxide ore? [1]
   b. What are the collectors used in froth floatation process? Name a substance that can be used as such. [1]
   c. What is the role of NaCN in the extraction of silver from a silver ore? [2]
   d. Why is copper matte put in silica lined converter? [1]
5. The list of organic compound are given as:

   C_2H_5Br, C_3H_5N, $C_3H_6O_2$, C_3H_7ON, C_2H_7N

   Write the compound in the proper reaction sequence.
6. An organic compound 'A' having molecular formula C_6H_5Cl. It is prepared by the chlorination of aromatic hydrocarbon.
   a. How can you prepare azo dye form 'A'? [2]
   b. An insecticide is prepared from 'A'. Write the name and structure. [2]
   c. Is 'A' give product by Wurtz Fittig reaction? [1]
7. a. What type of polymer is Teflon? Write its two uses. [2]
   b. Is picric acid dye or pesticides or polymer? What is the type? [1]
   c. What is fineness of cement and how can you test? [2]
8. An organic compound 'Z' having molecular formula C_6H_6O and having molecular mass 94. It is also knows as carbolic acid.
   a. How can you prepare an indicator which is used in acid base titration from 'Z'? [2]
   b. Is aromatic hydrocarbon prepared from 'Z'? [1]
   c. An azo dye is prepared from 'Z'. Write a suitable reaction and use. [2]

   OR

   An organic compound 'X' having molecular formula C_3H_7N and molecular mass 57. It is the derivatives of ammonia.
   a. Write the possible isomers of 'X' [1]
   b. How can you convert one isomer to another? [2]
   c. How can you test these to isomer? [2]

Group C: Long Answer Questions **[3×8=24]**

9. a. Which of the following are Lewis Acids? H_2O, BF_3, H^+ and NH_4^+ [1]
   b. The ionization constant of HF, HCOOH and HCN at 298 K are is 6.8×10^{-4}, 1.8×10^{-4} and 4.8×10^{-9} respectively, Calculate the ionization constant of the corresponding conjugate base. [3]
   c. The first ionization constant of H_2S is 9.1×10^{-8}. Calculate the concentration of HS^- ions in its 0.1 M solution and how will this concentration be affected if the solution is 0.1 M in HCl also? If the second dissociation constant of H_2S is 1.2×10^{-13}, calculate the concentration of S^{2-} under both conditions. [4]

   OR

   a. Ethanol boils at 78.4°C. The enthalpy of vaporization of ethanol is 42.4 kJ/mol. Calculate the entropy of vaporization of ethanol. [2]

b. State Hess law of constant heat summation and write its one limitation. [1]

c. Can a solution of 1 M $CuSO_4$ be stored in a vessel made up of nickel? If not why? [2]

[$E^0_{Ni^{++}/Ni} = -0.25$ V, $E^0_{Cu^{++}/Cu} = +0.34$V]

10. a. An alkene (A) undergoes ozonolysis to give two carbonyl compounds (B) and (C). The compound (B) on reduction with Zn–Hg/H^+ gives propane. The compound (C) reacts with HCN and followed by hydrolysis to produce 2-hydroxy propanic acid as the major product. Write chemical reactions involved and give the IUPAC name of A, B and C. [4]

b. How can you prepare compound 'A' from alcohol? [2]

c. Does compound 'B' give Fehling solution test? If yes, write a reaction and why? [2]

11. a. An organic compound (A) (molecular formula $C_8H_{16}O_2$) was hydrolysed with dilute sulphuric acid to give a carboxylic acid (B) and alcohol (C). Oxidation of (C) with chromic acid produced (B). (C) on dehydration gives but-1-ene. Write the equation for the reaction involved in it. [4]

b. What product would you expect when compound 'C' is heated with ammonia? [2]

c. Write the name of common test of compound 'B' and 'C'. Can both 'B' and 'C' react with sodium carbonate solution? [2]

OR

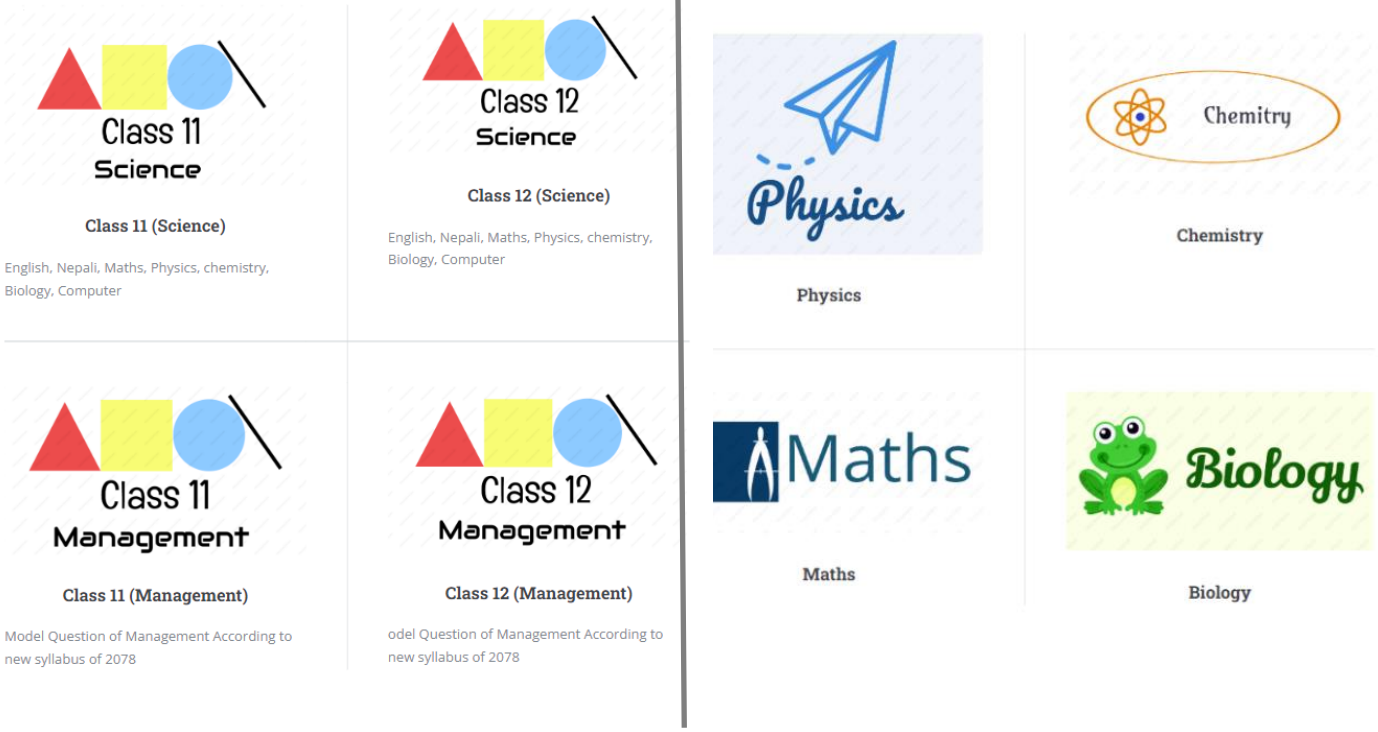
a. An aromatic compound 'A' on treatment with aqueous ammonia and heating forms compound 'B' which on heating with Br_2 and KOH forms a compound 'C' of molecular formula C_6H_7N. Write the structures and IUPAC names of compounds A, B and C. [4]

b. Compare the basicity of compound 'C' with ethanamine and ammonia. [2]

c. How can you prepare benzoin product from compound 'A'? Write a reaction with suitable reagent used. [2]

BIPO's notes

Class 12 complete notes and paper collection and solutions.



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