CBSE Class 12 Chemistry 2015 - Set 56/2 - Compartment

Question Paper

Conducted by the Central Board of Secondary Education (CBSE)

Time Allowed: 3 Hours **Maximum Marks: 70**

General Instructions

(i) This question paper contains 26 questions. All questions are compulsory.
(ii) Question number 1 to 5 are very short answer questions and carry 1 mark each.
(iii) Question number 6 to 10 are short answer questions and carry 2 marks each.
(iv) Question number 11 to 22 are also short answer questions and carry 3 marks each.
(v) Question number 23 is a value based question and carry 4 marks.
(vi) Question number 24 to 26 are long answer questions and carry 5 marks each.
(vii) Use log tables, if necessary. Use of calculators is not allowed.

Questions

1. What are emulsions? Give an example.

2. What is meant by chelate effect?

3. Write the IUPAC name of the following:

CH_3-CH_2-CHO

4. Arrange the following in increasing order of basic strength:

Aniline, p-Nitroaniline and p-Toluidine

5. What type of stoichiometric defect is shown by AgCl?

6. Explain the following:

(i) Nitrogen is much less reactive than phosphorus.

(ii) NF_3 is an exothermic compound but NCl_3 is an endothermic compound.

7(a). Describe the preparation of potassium permanganate. How does the acidified permanganate solution react with oxalic acid? Write the ionic equations for the reactions.

OR

7(b). Describe the oxidising action of potassium dichromate and write the ionic equations for its reaction with (i) an iodide (ii) H_2S.

8. Write the mechanism of acid dehydration of ethanol to yield ethene.

9. Define the following terms:

(i) Mole fraction (x)

(ii) Molality of a solution (m)

10. Write units of rate constants for zero order and for the second order reactions if the concentration is expressed in mol L^{-1} and time in seconds.

11(a). Answer the following:

(i) What is the role of cryolite in the metallurgy of aluminium?

(ii) Differentiate between roasting and calcination.

(iii) What is meant by the term 'chromatography'?

OR

11(b). Write the reactions taking place in different zones of the blast furnace to obtain iron.

12. What is meant by 'disproportionation'? Give one example of a disproportionation reaction in aqueous solutions.

13. Write the IUPAC name of the following:

(i) $[Co(NH_3)_6]Cl_3$

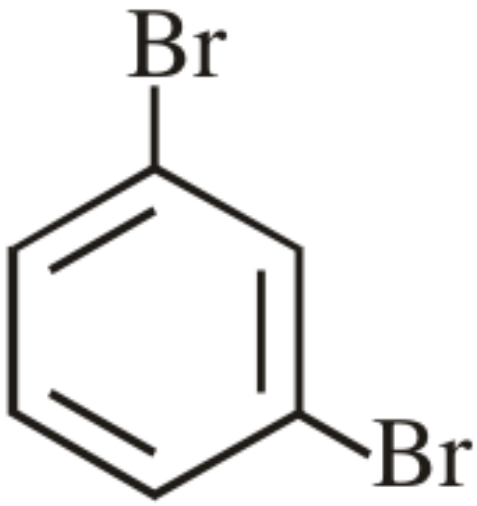
(ii) $[NiCl_4]^{2-}$

(iii) $K_3[Fe(CN)_6]$

14. Give the IUPAC names of the following compounds:

(i) $CH_3-CH(Br)-CH_2-CH_3$

(ii)



(iii) $CH_2=CH-CH_2-Cl$

15. How are the following conversions carried out?

(i) Benzyl chloride to Benzyl alcohol

(ii) Ethyl magnesium chloride to Propan-1-ol

(iii) Propene to Propan-2-ol

16. Write the major product in the following equations:

(i) $CH_3-CH_2OH \xrightarrow{PCl_5} ?$

(ii) Phenol + $CH_3-Cl \xrightarrow{anhyd.\ AlCl_3} ?$

(iii) $CH_3-Cl + CH_3CH_2-ONa \rightarrow ?$

17. Define the following as related to proteins:

(i) Peptide linkage

(ii) Primary structure

(iii) Denaturation

18. Explain the term 'copolymerization' and give two examples of copolymerization.

19. Silver crystallises in fcc lattice. If edge length of the unit cell is 4.077×10^{-8} cm, then calculate the radius of silver atom.

20. A 5 percent solution (by mass) of cane-sugar (M.W. 342) is isotonic with 0.877% solution of substance X. Find the molecular weight of X.

21. The rate constant for a first order reaction is 60 s^{-1}. How much time will it take to reduce the initial concentration of the reactant to its 1/10th value?

22. Describe the following processes:

(i) Dialysis

(ii) Electrophoresis

(iii) Tyndall effect

23. **Case Study:** Neeraj went to the departmental store to purchase groceries. On one of the shelves he noticed sugar-free tablets. He decided to buy them for his grandfather who was a diabetic. There were three types of sugar-free tablets. He decided to buy sucralose which was good for his grandfather's health.

(i) Name another sugar-free tablet which Neeraj did not purchase.

(ii) Was it right to purchase such medicines without a doctor's prescription?

(iii) What quality of Neeraj is reflected above?

24(a). (a) Elements of Group 16 generally show lower value of first ionization enthalpy compared to the corresponding elements of Group 15. Why?

(b) What happens when:

(i) Concentrated H_2SO_4 is added to CaF_2?

(ii) Sulphur dioxide reacts with chlorine in the presence of charcoal?

(iii) Ammonium chloride is treated with $Ca(OH)_2$?

OR

24(b). (a) Draw the structure of the following:

(i) BrF_3

(ii) XeO_3

(b) Answer the following:

(i) Why is NH_3 more basic than PH_3?

(ii) Why are halogens strong oxidising agents?

(iii) Draw the structure of $XeOF_4$.

25(a). (a) Draw the structures of the following:

(i) p-methylbenzaldehyde

(ii) 4-methylpent-3-en-2-one

(b) Give chemical tests to distinguish between the following pairs of compounds:

(i) Benzoic acid and ethyl benzoate

(ii) Benzaldehyde and acetophenone

(iii) Phenol and benzoic acid

OR

25(b). (a) Draw the structures of the following derivatives:

(i) Propanone oxime

(ii) Semicarbazone of CH_3CHO

(b) How will you convert ethanol into the following compounds? Give the related chemical equations.

(i) CH_3-CH_3

(ii) $CH_3-CH(OH)-CH_2-CHO$

26(a). Calculate Δ_rG° and e.m.f. (E) that can be obtained from the following cell under standard conditions at 25°C:

$Zn(s) \mid Zn^{2+}(aq) \mid\mid Sn^{2+}(aq) \mid Sn(s)$

Given: $E^\circ_{Zn^{2+}/Zn} = -0.76$ V; $E^\circ_{Sn^{2+}/Sn} = -0.14$ V and $F = 96500$ C mol^{-1}.

OR

26(b). (a) Define conductivity and molar conductivity for the solution of an electrolyte. Discuss their variation with concentration.

(b) Calculate the standard cell potential of the galvanic cell in which the following reaction takes place:

$Fe^{2+}(aq) + Ag^+(aq) \rightarrow Fe^{3+}(aq) + Ag(s)$

Calculate the Δ_rG° and equilibrium constant of the reaction also. ($E^\circ_{Ag^+/Ag} = 0.80$ V; $E^\circ_{Fe^{3+}/Fe^{2+}} = 0.77$ V)

- End of Question Paper -