

CBSE GUESS - 2015
Class – XII
Subject - Chemistry

Max. Marks: 70

Time:3 Hours

General Instructions:

1. All questions are compulsory.
2. Q. NO. 1 to 8 are very short answer questions & carry 1 mark each.
3. Q. No. 9 to 18 are short answer questions & carry 2 marks each.
4. Q. No. 19 to 27 are also short answer questions & carry 3 marks each.
5. Q. No. 28 to 30 are long answer questions & carry 5 marks each.
6. Use log tables if necessary, use of calculators is not allowed.

1. What is the role of depressant in froth floatation process ? (1)
2. Predict the shape of XeOF_4 on the basis of VSEPR theory.
(1)
3. What is the vant Hoff factor of an aqueous solution of Aluminium Nitrate, assuming complete dissociation?
(1)
- 4 What is the formula of a compound consisting of atoms A in hcp lattice & atoms B occupying $\frac{2}{3}$ rd of the tetrahedral voids?
(1)
5. Write down the structure of 3-oxobutanoylbromide. (1)
6. Complete the reaction: $\text{HNO}_3 + \text{P}_4\text{O}_{10} \longrightarrow$
(1)
7. What is zeta potential?
(1)
8. Write down the IUPAC name of $\text{CH}_2=\text{C}(\text{CH}_3)\text{--CH}_2\text{Br}$.
(1)

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9. (a) What is anoxia? (b) Give an application of reverse osmosis. (2)

10. Why monobromination of aniline requires acetylation first?

OR

Why nitration of aniline produces a substantial amount of meta - nitroaniline even though amino group is o,p directing ?

(2)

11. How would you distinguish between following pair of compounds by chemical test?

(a) Phenol & Cyclohexanol (b) s-butylalcohol & t-butylalcohol.

(2)

12. Complete the following reactions:

(a) $\text{PhN}_2\text{Cl} + \text{CH}_3\text{CH}_2\text{OH} \longrightarrow$ (b) $\text{CH}_3\text{CONH}_2 + \text{Br}_2 + \text{KOH} \longrightarrow$

(2)

13. Write down the mechanism of dehydration of ethanol to ethoxyethane by conc. H_2SO_4 at 413K (2)

14. Explain the difference between α & β Glucose, based on Haworth Representation. (2)

15. (a) What is specific base pairing in DNA molecule ?

(b) Show the formation of Zwitterion in Glycine.

(2)

16. (a) Why is copper matte put in a silica lined converter?

(b) What is the principle behind chromatographic refining method?

17.(a) Why effective collisions may not occur even if the reactant molecules possess the required activation energy ?

(b) What is a pseudo first order reaction? Give an example.

(2)

18. What would be the boiling point of a solution of 3g of Urea (NH_2CONH_2) dissolved in 40g of water? Given $K_b = 0.52 \text{ K Kg mol}^{-1}$.

(2)

19. A washerman could not wash clothes by using soap in water. His son Rajesh, a student of chemistry suggested using detergent in place of soap and this worked. Rajesh disclosed this to his teacher. The teacher discouraged the reckless use of detergent and suggested a modification. Now answer the following questions after reading this passage:

- (a) Why soap did not work but detergent worked?
 (b) Why the teacher was against the use of detergents and what modification would he have suggested?
 (c) What value is associated with this modification? (3)

20. Give reasons for the following:

- (a) NH_3 is a stronger base than BiH_3 .
 (b) White phosphorus is more reactive than red phosphorus.
 (c) $K_{a2} \ll K_{a1}$ for H_2SO_4 .

OR

- (a) H_3PO_2 is a stronger reducing agent than H_3PO_4 .
 (b) Catenation tendency is weaker in Nitrogen.
 (c) Chlorine water on standing loses its yellow colour.
 (3)

21. (a) Why treatment of alkyl halides with KOH (aq.) produces alcohols whereas on treatment with KOH (alc.), alkene is the main product?

(b) The reaction: $\text{CH}_2=\text{CH}-\text{CH}_2-\text{Cl} + \text{KOH}$ (aq.) \longrightarrow $\text{CH}_2=\text{CH}-\text{CH}_2-\text{OH} + \text{KCl}$ follows SN1 mechanism. What is the reason behind it?

(3)

22. For a first order gas phase reaction : $\text{A}(\text{g}) \longrightarrow \text{B}(\text{g}) + \text{C}(\text{g})$, the initial pressure was found to be 35mm of Hg and after 360 s the total pressure was found to be 54mm of Hg. Calculate the rate constant of the reaction.

(3)

23. Write the steps along with reactions for manufacturing Nitric Acid by Ostwald's Process. (3)

24.(a) Why is physisorption multilayered but chemisorption monolayered?

(b) Out of KCl & MgCl_2 which electrolyte is more effective in coagulating a given sample of silver sol? Give reason as well.

(c) What is Electrophoresis?

(3)

25.(a) Draw the geometrical isomers of triamminetribromidocobalt(III).

(b) Why hexamminecobalt(III) is an inner orbital complex where as hexafluoridocobaltate(III) is an outer orbital complex?

(3)

26. (a) Write down the structures of the monomeric units of Nylon 6,6.

(b) What is the difference between Buna-S & Buna-N?

(c) What is the function of benzoylperoxide in the polymerization of ethene? (3)

27. How many unit cells would be there in 1cm^3 of Al which crystallizes in fcc lattice & has atomic radius of 125pm?
(3)

28. (a) An organic compound of molecular mass 86u does not reduce Tollen's Reagent but forms addition product with NaHSO_3 & undergoes iodoform reaction. On vigorous oxidation it produces ethanoic acid & propanoic acid. Identify the compound & write any two reactions involved.

(b) Write a reaction representing Cannizzaro's Reaction.

(c) Rearrange CH_3COOH , ClCH_2COOH , HCOOH , FCH_2COOH in the increasing order of their pka values.

OR

(a) How would you convert

(i) Bromobenzene to Benzoic Acid

(ii) Ethanal to But-2-en-1-al

(iii) Ethanenitrile to Chloroethanoic acid?

(b) Why out of two amino groups in semicarbazide only one is involved in formation of semicarbazone?

(c) Write a reaction representing Rosenmund's Partial Reduction. (3+1+1)

29. (a) Calculate the cell potential of a galvanic cell consisting of 2M zinc & 0.5M copper electrodes. Given $E^0 \text{Zn}^{+2}/\text{Zn} = -0.76\text{V}$ & $E^0 \text{Cu}^{+2}/\text{Cu} = +0.34\text{V}$.

(b) Deduce the units of limiting molar conductivity.

(c) Why the cell potential of a mercury cell remains constant throughout its life?

OR

(a) The resistance of a conductivity cell filled with 0.1M KCl is 100 ohm and its conductivity is found to be 1.29Sm^{-1} . Calculate the conductivity & molar conductivity of 0.02M KCl when filled in the same cell which now shows a resistance of 520 ohm.

(b) What is electrochemical equivalent?

(c) Why alkaline medium inhibits corrosion of iron? (3+1+1)

30. (a) Why transition metals:

(i) Have high enthalpies of atomization

(ii) Can act as good catalyst

(iii) Can form complexes very effectively.

(b) Why effect of Actinoid Contraction is more than that of Lanthanoid Contraction?

(c) Write the reaction showing the action of heat on KMnO_4 .

OR

(a) What happens when the pH of an aq. solution containing Chromate ions is made lower than 7? Write the relevant reaction.

(b) Why the actinoids have a greater range of oxidation states than lanthanoids?

(c) What is the spin only moment of Ni^{+2} ion?

- (d) Why Cu is the only metal in 3d series having positive standard electrode potential?
(e) Why most of the transition metal ions are coloured? (1X5)

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