

SAIVEERA ACADEMY'S PUBLIC MODEL QUESTION PAPER – 1
XII – CHEMISTRY

Marks: 70

Time: 3 Hours

PART – I

Note: (i) Answer all the questions.

15 × 1 = 15

(ii) Choose the most appropriate answer from the given four alternatives and write the option code and the corresponding answer.

- Which of the following oxidation states is most common among the lanthanoids?
(a) 4 (b) 3 (c) 2 (d) 1
- Oxidation state of carbon in its hydrides
(a) -4 (b) +4 (c) +3 (d) +2
- The rate constant of a reaction is $5.8 \times 10^{-2} \text{ s}^{-1}$. The order of the reaction is
(a) Second order (b) zero order (c) First order (d) Third order
- Solid CO_2 is an example of
(a) molecular solid (b) Covalent solid (c) ionic solid (d) metallic solid
- Which of the metal is extracted by Hall-Herold process?
(a) Al (b) Ni (c) Cu (d) Zn
- pH of a saturated solution of Ca(OH)_2 is 9. The Solubility product of Ca(OH)_2
(a) 0.25×10^{-10} (b) 0.5×10^{-15} (c) 0.125×10^{-15} (d) 0.5×10^{-10}
- The shape of ozone is
(a) V-shape (b) Linear shape (c) bent shape (d) spherical shape
- For Freundlich isotherm a graph of $\log \frac{x}{m}$ is plotted against $\log p$. The slope of the line and its y – axis intercept respectively corresponds to
(a) $\frac{1}{n}$, k (b) $\frac{1}{n}$, $\log k$ (c) $\log \frac{1}{n}$, k (d) $\frac{1}{n}$, $\log 1/k$
- In the reaction ethanol $\xrightarrow{\text{PCl}_5} \text{X} \xrightarrow{\text{alc.KOH}} \text{CH}_2 = \text{CH}_2 \xrightarrow{\text{H}_2\text{SO}_4/\text{H}_2\text{O}} \text{Z}$. The Z is
(a) ethanol (b) ethoxyethane (c) ethane (d) ethylbisulphite
- The acid that cannot be prepared by Grignard reagent
(a) Acetic acid (b) Formic acid (c) Butyric acid (d) benzoic acid
- How many moles of I_2 are liberated when 1 mole of potassium dichromate react with potassium iodide?
(a) 3 (b) 2 (c) 1 (d) 4
- Assertion:** Acetamide on reaction with KOH and bromine gives acetic acid
Reason: Bromine catalyses hydrolysis of acetamide.

- if both assertion and reason are true and reason is the correct explanation of assertion.
- if both assertion and reason are true but reason is not the correct explanation of assertion.
- assertion is true but reason is false
- both assertion and reason are false

13. Starch contains 20% of _____ and 80% of _____.

- ribulose , amylose
- mylopectin , amylose
- amylose , amylopectin
- amylopectin , ribulose

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14. Aspirin is a/an

a) acetylsalicylic acid

b) benzoyl salicylic acid

c) chlorobenzoic acid

d) anthranilic acid

15. $1F$ equals to

(a) 96500 M

(b) 96500 C

(c) $1.6 \times 10^{-19}C$

(d) both a and c

PART – II

Note: Answer any six questions. Question No. 24 is compulsory.

$6 \times 2 = 12$

16. What is the role of Limestone in the extraction of Iron from its oxide Fe_2O_3 ?

17. Write down tests for sulphuric acid

18. What is packing efficiency?

19. Define ionic product of water. Give its value at room temperature

20. State Kohlrausch Law

21. Write about the Test to differentiate alcohol and phenols

22. Identify A, B for the following reaction $C_6H_5NO_2 \xrightarrow{Fe/HCl} A \xrightarrow{HNO_2/273 K} B$

23. Draw the structure of CO molecule

24. Write the structure of the major product of the aldol condensation of benzaldehyde with acetone

PART – III

Note: Answer any six questions. Question No. 33 is compulsory.

$6 \times 3 = 18$

25. What is catenation? describe the catenation property of carbon

26. Explain Coordination and ionisation isomerism with example

27. Explain pseudo first order reaction with an example

28. What are importance of Brownian movement?

29. Starting from phenol how will you prepare the following

(i) Cyclohexanol

(ii) Picric acid

(iii) Aniline

30. What is urotropine? How it is prepared and draw its structure

31. Write down the difference between DNA and RNA

32. Write short notes on the following

(i) Gabriel phthalimide synthesis

(ii) Gomberg reaction

33. The resistance of 0.15 M solution of an electrolyte is 50Ω . The specific conductance of the solution is $2.4 S m^{-1}$. The resistance of 0.5 N solution of the same electrolyte measured using the same conductivity cell is 480Ω . Find the equivalent conductivity of 0.5 N solution of the electrolyte.

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PART – IV

Note: Answer all the questions.

5 × 5 = 25

34.(a) (i) What do you mean by cementation?

(ii) How will you prepare nitric acid by Ostwald process?

OR

(b) (i) What are the general electronic configurations of lanthanide and actinides?

(ii) Write any three postulates of Werner's theory

35.(a) (i) What is a piezoelectric crystal?

(ii) Write a note on (A) Covalent solids (B) Molecular solids

OR

(b) Derive the integrated rate law for a first order reaction $A \rightarrow \text{Products}$

36.(a) (i) What are the limitations of the Arrhenius concept?

(ii) Explain factors affecting electrolytic conductance

OR

(b) (i) Define Gold number

(ii) Write down the importance of carbohydrates

37.(a) Write any three tests for aldehydes

OR

(b) How will you distinguish between primary, secondary and tertiary aliphatic amines?

38.(a) Phenol is distilled with Zn dust followed by Friedel-Crafts alkylation with propyl chloride to give a compound B, B on oxidation gives (c) Identify A, B and C.

OR

(b) How will you prepare the following polymers

(i) Nylon-2 Nylon - 6

(ii) Nylon - 6,6

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PART – I

Note: (i) Answer all the questions.

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(ii) Choose the most appropriate answer from the given four alternatives and write the option code and the corresponding answer.

1. Catalyst used in contact process is

- (a) TiCl_4 (b) Fe (c) V_2O_5 (d) Mo

2. On reacting with neutral ferric chloride, phenol gives _____ colour

- (a) red (b) green (c) violet (d) no colour

3. Tollen's reagent is

- a) ammoniacal cuprous chloride b) ammoniacal cuprous oxide
c) ammoniacal silver nitrate d) ammoniacal silver chloride

4. The process of Gold is reduced to its elemental state (Zero oxidation state) is called

- (a)) oxidation (b) cementation (c) galvanization (d) smelting

5. If 75% of a first order reaction was completed in 60 minutes, 50% of the same reaction under the same conditions would be completed in

- (a) 30 minutes (b) 20 minutes (c) 35 minutes (d) 75 minutes

6. The basic structural unit of silicates is

- (a) $(\text{SiO}_4)^{4-}$ (b) $(\text{SiO}_3)^{2-}$ (c) $(\text{SiO}_4)^{2-}$ (d) $(\text{SiO})^{2-}$

7. The cathode in Leclanche cell is

- a) Zinc container b) spongy lead
c) graphite rod in contact with MnO_2 d) HgO mixed with graphite.

8. In acid medium, potassium permanganate oxidizes oxalic acid to

- (a) Carbon dioxide (b) oxalate (c) acetate (d) acetic acid

9. CsCl has bcc arrangement, its unit cell edge length is 400pm, its inter atomic distance is

- (a) 800pm (b) $\left(\frac{\sqrt{3}}{2}\right) \times 400\text{pm}$ (c) 400pm (d) $\sqrt{3} \times 100\text{pm}$

10. Hair cream is

- (a) gel (b) sol. (c) solid sol (d) emulsion

11. The magnetic moment of Mn^{2+} ion is

- (a) 2.80BM (b) 5.92BM (c) 8.95BM (d) 3.90BM

12. Which one of the following reaction is an example of disproportionation reaction

- a) Aldol condensation b) cannizaro reaction
c) Benzoin condensation d) none of these

13. The order of basic strength for methyl substituted amines in aqueous solution is

- a) $\text{N}(\text{CH}_3)_3 > \text{N}(\text{CH}_3)_2 > \text{N}(\text{CH}_3)\text{H}_2 > \text{NH}_3$
b) $\text{N}(\text{CH}_3)\text{H}_2 > \text{N}(\text{CH}_3)\text{H} > \text{N}(\text{CH}_3)_3 > \text{NH}_3$
c) $\text{NH}_3 > \text{N}(\text{CH}_3)\text{H}_2 > \text{N}(\text{CH}_3)_2\text{H} > \text{N}(\text{CH}_3)_3$
d) $\text{N}(\text{CH}_3)_2\text{H} > \text{N}(\text{CH}_3)\text{H}_2 > \text{N}(\text{CH}_3)_3 > \text{NH}_3$

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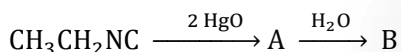
14. Fructose is not oxidised by bromine water indicates
- a) the presence of aldehydic group
b) presence of ketonic group
c) absence of aldehydic group
d) absence of ketonic group
15. Nylon is an example of
- (a) polyamide (b) polythene (c) poly saccharide (d) polyester

PART – II

Note: Answer any six questions. Question No. 24 is compulsory.

$6 \times 2 = 12$

16. Explain McAfee Process
17. Draw the Structure of permanganate ion
18. Write Arrhenius equation and explains the terms involved
19. Define electrochemical equivalent of the substance
20. What is the difference between homogenous and heterogenous catalysis?
21. What is meta merism and write down its example
22. What are the test for carboxylic acid?
23. Write down the difference between red and white phosphorous
24. Identify A & B for the following reaction

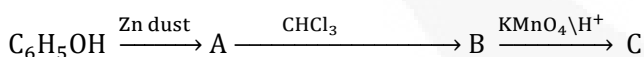


PART – III

Note: Answer any six questions. Question No. 33 is compulsory.

$6 \times 3 = 18$

25. How will you concentrate ferromagnetic ores by magnetic separation method
26. Explain the types of complexes based on kind of ligand and net charge of the complex ion
27. Write down the difference between lanthanide and actinides
28. Explain common ion effect with an example
29. Write a note on electro osmosis
30. Complete the following reaction



31. Write a short note on

- (i) Perkins' reaction
(ii) Knoevenagel reaction

32. Write down the possible isomers of the $\text{C}_4\text{H}_9\text{NO}_2$ give their IUPAC names

33. Ionic conductance at infinite dilution of Al^{3+} and SO_4^{2-} are 189 and 160 $\text{mho cm}^2 \text{equiv}^{-1}$. Calculate the equivalent and molar conductance of the electrolyte $\text{Al}_2(\text{SO}_4)_3$ at infinite dilution

PART – IV

Note: Answer all the questions.

$5 \times 5 = 25$

- 34.(a) (i) Explain about Van-Arkel method for refining zirconium
(ii) Explain why fluorine always exhibit an oxidation state of -1 ?

OR

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(b) Based on VB theory explain why $[\text{Cr}(\text{NH}_3)_6]$ is paramagnetic, while $[\text{Ni}(\text{CN})_4]$ is diamagnetic.

35.(a) (i) Define isotropy and anisotropy

(ii) How will you classify point defects?

OR

(b) (i) Define half life of a reaction. Show that for a first order reaction half life is independent of initial concentration.

(ii) Give examples of first order reaction

36. (a) Derive an expression for Ostwald's dilution law

OR

(b) Derive an expression for Nernst equation

37.(a) Write a short note on (i) Riemer Tiemann Reaction (ii) Kolbe's reaction (iii) Coupling reaction of phenol

OR

(b) How will you convert nitrobenzene into the following

(A) azoxybenzene

(B) Hydrozobenzene

(C) N – phenylhydroxylamine

(D) aniline

38. (a) An alkene (A) on ozonolysis gives propanone and aldehyde (B). When (B) is oxidised (C) is obtained. (C) is treated with Br_2/P gives (D) which on hydrolysis gives (E). When propanone is treated with HCN followed by hydrolysis gives (E). Identify A, B, C, D and E.

OR

(b) (i) What is peptide bond? Write down the peptide bond formation between glycine and alanine

(ii) How will you prepare Buna-N?

SAIVEERA ACADEMY'S PUBLIC MODEL QUESTION PAPER – 3
XII - CHEMISTRY

Marks: 70

Time: 3 Hours

PART – I

Note: (i) Answer all the questions.

15 × 1 = 15

(ii) Choose the most appropriate answer from the given four alternatives and write the option code and the corresponding answer.

1. The geometry at which carbon atom in diamond are bonded to each other is

- (a) Octahedral (b) hexagonal (c) Tetrahedral (d) none of these

2. The fraction of total volume occupied by the atoms in a simple cubic is

- (a) $\left(\frac{\pi}{4\sqrt{2}}\right)$ (b) $\left(\frac{\pi}{4}\right)$ (c) $\left(\frac{\pi}{3\sqrt{2}}\right)$ (d) $\left(\frac{\pi}{6}\right)$

3. The catalytic behaviour of transition metals and their compounds is ascribed mainly due to

- a) their magnetic behaviour
b) their unfilled d orbitals
c) their ability to adopt variable oxidation states
d) their chemical reactivity

4. The noble gas which can penetrate through dense fog is

- (a) He (b) Ne (c) Kr (d) Rn

5. The half life period of a radioactive element is 140 days. After 560 days, 1 g of element will be reduced to

- (a) $\left(\frac{1}{16}\right)$ g (b) $\left(\frac{1}{2}\right)$ g (c) $\left(\frac{1}{4}\right)$ g (d) $\left(\frac{1}{8}\right)$ g

6. Conjugate base for Bronsted acids H₂O and HF are

- a) OH⁻ and H₂FH⁺, respectively b) H₂O and F⁻, respectively
c) OH⁻ and F⁻ respectively d) H₃O⁺ and H₂F⁺, respectively

7. The battery used in pacemakers is

- a) Lead storage battery b) Daniel cell
c) Leclanche cell d) Mercury button battery

8. Which one of the following characteristics are associated with adsorption?

- a) ΔG and ΔH are negative but ΔG is positive
b) ΔG and ΔS are negative but ΔH is positive
c) ΔG is negative but ΔH and ΔS are positive
d) ΔG, ΔH and ΔS all are negative.

9. Isopropylbenzene on air oxidation in the presence of dilute acid gives

- (a) Propanal (b) Phenol (c) Propanol (d) Phenylbenzene

10. Aldol obtained from acetaldehyde is

- a) 2-hydroxy butanol b) 3-hydroxy butanol
c) 3-hydroxy butanal d) 2-hydroxy butanal

11. In Hall-Herold process, which one act as an anode.

- (a) Carbon blocks (b) Hydrogen (c) Copper rods (d) Zinc rods

12. Which one of the following will not undergo Hofmann bromamide reaction

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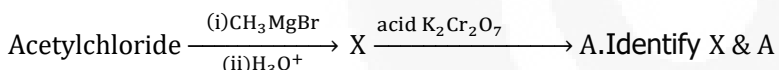
- a) $\text{CH}_3\text{CONHCH}_3$ b) $\text{CH}_3\text{CHCONH}_2$
c) CH_3CONH_2 d) $\text{C}_6\text{H}_5\text{CO NH}_2$
13. Carbohydrates are
a) polyhydroxy aldehydes b) polyhydroxy ketones
c) polyhydroxy acids d) both (a) and (b)
14. Non stick cook wares generally have a coating of a polymer, whose monomer is
a) ethane b) prop-2-enitrile
c) chloroethene d) 1,1,2,2-tetrafluoroethane
15. Ethanoic acid $\xrightarrow{\text{P/Br}_2}$ 2-bromoethanoic acid. This reaction is called
a) Finkelstein reaction b) Haloform reaction
c) Hell – Volhard – Zelinsky reaction d) none of these

PART – II

Note: Answer any six questions. Question No. 24 is compulsory.

6 × 2 = 12

16. What is blister copper? How it is obtained?
17. In an octahedral crystal field, draw the figure to show splitting of d orbitals
18. Sketch (i) BCC (ii) FCC
19. Define solubility product
20. Peptising agent is added to convert precipitate into colloidal solution. Explain with an example
21. What is Transesterification?
22. Why Gabriel phthalimide synthesis is preferred for synthesising primary amines only?
23. Write down the factors responsible for anomalous behaviour of nitrogen
24. What will be the product for the following reaction



PART – III

Note: Answer any six questions. Question No. 33 is compulsory.

6 × 3 = 18

25. Explain how metallic oxides are reduced by aluminothermite process
26. What is an elementary reaction? Give the differences between order and molecularity of a reaction.
27. State Faraday's Laws of electrolysis
28. Give uses of (i) Helium (ii) nitric acid
29. How will you prepare phenolphthalein from phenol?
30. How will you prepare the following
 (i) Acetic anhydride from acetic acid
 (ii) Ethane from Sodium acetate
 (iii) Acetamide from Methyl acetate
31. Write down the importances of Proteins
32. Write short notes on the following
 (i) Carbylamine reaction (ii) Mustard oil reaction

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33. KF crystallizes in fcc structure like sodium chloride. Calculate the distance between K^+ and F^- in KF. (Given: density of KF is 2.48 g cm^{-3})

PART – IV

Note: Answer all the questions.

$5 \times 5 = 25$

34.(a) (i) Give uses of alum

(ii) Explain hydrate isomers & linkage isomerism with an example.

OR

(b) (i) How will you prepare sulphuric acid by contact process

(ii) Give any two uses of potassium dichromate and potassium permanganate

35. (a) Derive integrated rate law for a zero order reaction and give its example

OR

(b) Explain the buffer action of acidic buffer

36.(a) Describe adsorption theory of catalysis

OR

(b) Write down the five differences between glucose and fructose

37.(a) How will you prepare the following from ethylene glycol

(A) Oxirane

(B) Ethanal

(C) Ethene

OR

(b) Write a short note on (i) Hoffmann's degradation (ii) Hell – Volhard – Zelinsky reaction (iii) Claisen Condensation

38.(a) A dibromo derivative (A) on treatment with KCN followed by acid hydrolysis and heating gives a monobasic acid (B) along with liberation of CO_2 . (B) on heating with liquid ammonia followed by treating with Br_2/KOH gives (c) which on treating with NaNO_2 and HCl at low temperature followed by oxidation gives a monobasic acid (D) having molecular mass 74. Identify A to D.

OR

(b) Explain cleansing action of soaps and detergents