PUBLIC QUESTION PAPER – MARCH 2020
XII - CHEMISTRY
PART – I

Note: (i) Answer all the questions. $15 \times 1 = 15$

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

1.Match the following

1)	Fluorine	i.	Identification of coloured metal ion
2)	Borax	ii.	Strong oxidising agent
3)	Aluminium	iii.	Chalcogens Present in Volcanic ashes
4)	Sulphur	iv.	Most abundant element

(a) (1) – (iii) , 2-(ii) , 3-(iv) , 4-(i)   (b) (1) – (ii) , 2-(i) , 3-(iv) , 4-(iii)

(c) (1) – (iv) , 2-(iii) , 3-(ii) , 4-(i)   (d) (1) – (ii) , 2-(iv) , 3-(i) , 4-(iii)

2. Wolframite ore is separated from tinstone by the process of

(a) Electromagnetic separation   (b) Smelting

(c) Calcination   (d) Roasting

3.The transition metal which has only +3 oxidation state

(a) Ni   (b) Mn   (c) Cr   (d) Sc

4.The medicinal value of a drug is measured in terms of its

(a) Deoxyribose   (b) Gold Number

(c) Therapeutic index   (d) Equilibrium constant

5. The aqueous solutions of sodium formate,anilinium chloride and potassium cyanide are respectively

(a) acidic, acidic, acidic   (b) acidic,acidic basic

(c) basic, acidic, basic   (d) basic,neutral,basic,

6. If one strand of the DNA has the sequence 'ATGCTTGA', then the sequence of complementary strand would be

(a) TACGRAGT   (b) TACGAACT   (c)TCCGAACT   (d) TACGTACT

7. Which one of the following is most basic?

a) 2,4 – dibromoaniline   b) 2,4 – dichloroaniline

c) 2,4 – dimethyl aniline   d) 2,4 – dinitroaniline

8. How many faradays of electricity are required for the following reaction to occur $MnO_4^- \longrightarrow Mn^{2+}$

(a) 7F   (b) 5F   (c) 3F   (d) 1F

9. **Assertion:** p-N,N-dimethyl aminobenzaldehyde undergoes benzoin condensation.

   Reason: The aldehyde ($-CHO$) group is meta directing

(a) Both assertion and reason are false

(b) Both assertion and reason are true and reason is the correct explanation of assertion

(c) Both assertion and reason are true and reason is not the correct explanation of assertion

(d) Assertion is true but reason is false

10.Laptops have

(a) Lead storage battery　　(b) Mercury button　　(c) Fuel cell　　(d)Lithium ion battery

11. Formula for hyponitrous acid:

(a) HOONO　　　　(b) H_2NO_2　　　(c) HNO_2　　(d) HNO_4

12. Williamson synthesis of preparing dimethyl ether is a / an /

a) electrophilic substitution　　　　　　　　b) SN^1 reactions

c) SN^2 reaction　　　　　　　　　　　　d) electrophilic addition

13. The vacant space in bcc lattice unit cell is

(a) 26%　　　　　(b) 48%　　　　　(c)23%　　　　(d) 32%

14.Time required for the reactant concentration to reach one of its initial value is called

(a) half life　　　　(b) first order　　(c) zero order　　(d) second order

15.The major product when phenol reacts with conc.H_2SO_4 at 280K

(a) salicyclic acid　　(b) picric acid　　(c) o-phenol　　(d) p-phenol

PART – II

Note: Answer any six questions. Question No. 24 is compulsory.　　　　$6 \times 2 = 12$

16.How is bleaching powder is prepared?

17.Clasiify the following elements into d-block and f-block elements

(i) Tungsten (ii) Ruthenium (iii) Promethium (iv)Einstenium

18.Write any two hydrate isomers for the following complex $CrCl_3.6H_2O$

19.If the no of closed packed sphere is 6,then calculate the number of octahedral and tetrahedral voids generated

20. What are Lewis acids and bases? Give an example for each

21.What is dispersed phase and medium for butter?

22.Name the catalyst used in Rosenmund reduction and state its importance

23.How is chloropicrin is prepared?

24.Why is C-O-C bond angle in ether is slightly greater than the tetrahedral bond angle?

PART – III

Note: Answer any six questions. Question No. 33 is compulsory.　　　　$6 \times 3 = 18$

25. Write Chromyl chloride test?

26. [Sc $(H_2O)_6]^{3+}$is colourless-explain.

27.Derive Henderson equation

28.How are the metals protected from the cathodic protection?

29.Mention the shapes of colloidal particles

(i) As_2S_3 Sol (ii) Blue gold sold (iii) Tungstic acid sol

30. Formic acid reduces tollens reagent whereas acetic acid does not reduce. Give reason

31. How are proteins classified based on their structure. Explain

32. State the Advantages of food additives

33. There is only marginal difference in decrease in enthalpy from aluminium to thallium explain. Why?

PART – IV

Note: Answer all the questions.   **$5 \times 5 = 25$**

34. (a) Explain zone refining process

OR

 (b) (i) Write any condition for catenation

  (ii) Why HF cannot be stored in glass bottles

35. (a) (i) Write the molecular formula and draw the structure of sulphurous acid and Marshall's acid

  (ii) Write the IUPAC name of the following (A) $[Ag(NH_3)]^+$ (B) $[Co(NH_3)_3]^{2+}$

OR

 (b) (i) calculate the magnetic moment and magnetic property of $[CoF_6]^{3-}$

  (ii) Write a note on Frenkel defect

36. (a) Derive integrated rate law for a first order reaction $A \xrightarrow{yields} product$

OR

 (b) (i) Write the pH value of the following substances:

    (A) Vinegar (B) Black coffee (C) Baking soda (D) Soapy water

  (ii) A conductivity cell has two platinum electrodes separated by a distance of 1.5 cm and the cross sectional area of each electrode is 4.5 sq.cm. Using this cell, resistance of 0.5 N electrolytic solution was measured as 15 Ohms. Find the specific conductance of the solution

37. (a) (i) Give any three differences between physical and chemical adsorption

  (ii) What is vulcanization?

OR

 (b) (i) Give the coupling reaction of phenol

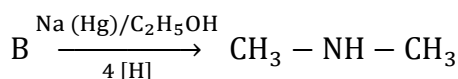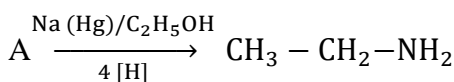 (ii) How will you prepare the following using Grignard reagent? (A) propan-1-ol (B) propan-2-ol

38. (a) (i) What is formalin? And its use

  (ii) What is glycosidic linkage

OR

 (b) (i) What is Gomberg reaction? Explain

  (ii) Identify A & B

$A \xrightarrow[4\,[H]]{Na\,(Hg)/C_2H_5OH} CH_3 - CH_2 - NH_2$

$B \xrightarrow[4\,[H]]{Na\,(Hg)/C_2H_5OH} CH_3 - NH - CH_3$

1) b	2) a	3) d	4) c	5) c	6) b	7) c	8) b	9) c	10) d
11) b	12) c	13) d	14) a	15) c					

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PUBLIC QUESTION PAPER – SEP 2020
XII - CHEMISTRY
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 incorrect statement among the following is
(a) Nickel is refined by Mond's process

(b) Titanium is refined by Van Arkel's process

(c) Zinc blende is concentrated by froth floatation

(d) In the metallurgy of gold, the metal is leached with dilute sodium chloride solution

2. The metal used in packing material for food items

(a) Zn   (b) Zr   (c) Al   (d) Au

3. Sodium salt of tetraboric acid is known as

(a) B_2H_6 (b) Na_2BO_3 (c) H_3BO_3 (d) $Na_2B_4O_7 . 10H_2O$

4._____ is used for producing smoke screen as it gives large smoke

(a) borax   (b) diborane   (c) potash alum   (d) phosphine

5. The actual position of lanthanoids in the periodic table is at

(a) Group number 3 & Period number 4   (b) Group number 6 & Period number 3

(c) Group number 4 & Period number 4   (d) Group number 3 & Period number 6

6. Fac-mer isomerism is shown by
(a) $[Co(en)_3]^{3+}$ (b) $[Co(NH_3)_4(Cl)_2]^+$ (c) $[Co(NH_3)_3(Cl)_3]$ (d) $[Co(NH_3)_5Cl]SO_4$

7. The packing efficiency of body centered cube (BCC)

(a) 52.31 %   (b) 68 %   (c) 86 %   (d) 52.13 %

8. The rate constant of a reaction is 5.8×10^{-2} s^{-1}. The order of the reaction is

(a) First order   (b) zero order   (c) Second order   (d) Third order

9. Conjugate base for Bronsted acids H_2O and HF are

(a) OH^- and H_2FH^+, respectively   (b) H_2O and F^-, respectively

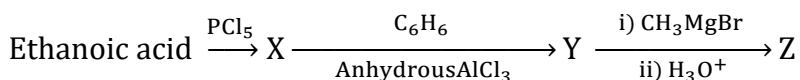(c) OH^- and F^- respectively   (d) H_3O^+ and H_2F^+, respectively

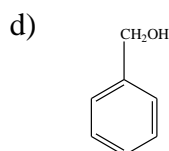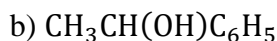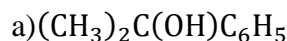10. When $\Delta s < 0$ & $T\Delta S$ is negative

(a) adsorption is exothermic   (b) absorption is exothermic

(c) adsorption is endothermic   (d) absorption is endothermic

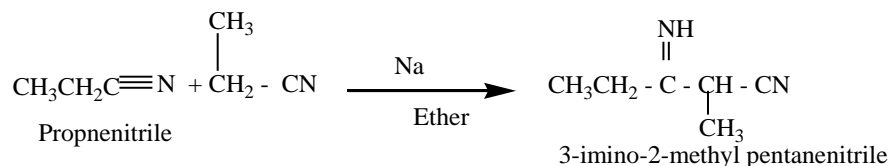11. In the preparation of ether by wiiliamson synthesis using primary alkyl halide involves

(a) E_1 mechanism   (b) S_N2 mechanism   (c) S_N1 (d) E_2

12. Predict the product Z in the following series of reactions

Ethanoic acid $\xrightarrow{PCl_5}$ X $\xrightarrow[\text{AnhydrousAlCl}_3]{C_6H_6}$ Y $\xrightarrow[\text{ii) } H_3O^+]{\text{i) } CH_3MgBr}$ Z

a)$(CH_3)_2C(OH)C_6H_5$ b) $CH_3CH(OH)C_6H_5$

c) $CH_3CH(OH)CH_2 - CH_3$ d)

13.

Propnenitrile

3-imino-2-methyl pentanenitrile

Above reaction is

(a) Thrope nitrile condensation   (b) Levine & Hauser

(c) Lederer- Manase reaction   (d) Aldol condensation

14. Cheilosis is a vitamin deficiency disease caused by

(a) Vitamin B_6 (b) Vitamin B_9 (c) Vitamin B_7 (d) Vitamin B_2

15.Match the following

  1) Major transquilizers   i.   Non Steroidal anti inflammatory drug

  2) Alagesics   ii.   Propofol

  3) NSAIDs   iii.   Clozapine

  4) Intravenous general anaesthetics   iv.   Aspirin

 (a) 1-(iii) , 2-(iv) , 3-(i) , 4-(ii)   (b) 1-(i) , 2-(ii) , 3-(iii) , 4-(iv)

 (c) 1-(ii) , 2-(i) , 3-(iv) , 4-(iii)   (d) 1-(iv) , 2-(iii) , 3-(ii) , 4-(i)

PART – II

Note: Answer any six questions. Question No. 24 is compulsory. $6 \times 2 = 12$

16. Explain the following with example (i) Gangue (ii) Slg

17. Give the uses of helium.

18. What are interstitial compounds?

19.Distinguish between isotropy and anisotropy in solids

20.The rate of the reaction $x + 2y \rightarrow$ product is $4 \times 10^{-3} molL^{-1}s^{-1}$, if $[x] = [y] = 0.2$ M & the rate

constant at 400K is $2 \times 10^{-2}s^{-1}$, what is the overall order of the reaction?

21.Calculate the pH of 0.1M CH_3COONa solution (pK_a for CH_3COOH is 4.74)

22.Convert glycerol to acrolein

23.Write a note on denaturation of proteins

24.How is aryl halide prepared by using Cu_2Cl_2/HCl (or) Cu_2Br_2/HBr?

PART – III

Note: Answer any six questions. Question No. 33 is compulsory. $6 \times 3 = 18$

25. What are the factors responsible for the Anomalous properties of the first elements of p – block

26. Which metal in the 3d series exhibits +1 oxidation state most frequently and why?

27. Mention the metal complexes and its metal ions used in biological system

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

29. What is inversion of phase

30. Explain Benedicts's solution test

31. Write any three biological importance of lipds

32. How is neoprene prepared?

33. A solution of silver nitrate is electrolysed for 30 minutes with a current of 2 amperes. Calculate the mass of silver deposited at the cathode

PART – IV

Note: Answer all the questions. $5 \times 5 = 25$

34. (a) (i) What is the difference between minerals and ores?

    (ii) Write the balanced reaction of chlorine with hot and cold NaOH

OR

  (b) (i) What is catenation?

    (ii) Write a note on Holmes signal

35. (a) Write the postulates of Werner's theory

OR

  (b) (i) Explain Schottky defect

   (ii) Identify auto catalyst in the following reaction

     (A) $CH_3COOC_2H_5 + H_2O \rightarrow CH_3COOH + C_2H_5OH$ (B). $2AsH_3 \rightarrow 2As + 3H_2$

36. (a) (i) Explain the effect of catalyst on reaction rate with an example

    (ii) Classify the following into Lewsi acid and bases -   A. BF_3 B. CO_2 C. MgO D. CH_3^-

OR

  (b) Derive an expression for Nernst equation

37. (a) (i) Name the factors affecting adsorption

    (ii) Explain the auto oxidation of ethers

OR

  (b) (i) What is Baeyer's reagent? How it converts ethane to ethylene glycol?

    (ii) How do antiseptics differs from disinfectants?

38. (a) Write the mechanism of Aldol condensation

OR

  (b) (i) Name the reducing agent in the reduction of nitrobenzene in the following

     A. Aniline   B. Phenylhydroxylamine   C. Nitrobenzene

    (ii) Write the Mustard oil reaction

1) d	2) c	3) d	4) d	5) d	6) c	7) b	8) a	9) c	10) a
11) b	12) a	13) a	14) d	15) a					

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PUBLIC QUESTION PAPER – JULY 2021
XII - CHEMISTRY
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 crystal with a metal deficiency defect is

(a) ZnO   (b) NaCl   (c) KCl   (d) FeO

2. The pyrimidine bases present in DNA are

(a) Cytosine & thiamine   (b) Cytosine & adenine

(c) Cytosine & Uracil   (d) Cytosine & Guanine

3. The pH of an aqueous solution is Zero. The solution is

(a) neutral   (b) slightly acidic   (c) basic   (d) strongly acidic

4. On reacting with neutral ferric chloride, phenol gives

(a) dark green colour   (b) red colour   (c) no colouration.   (d) violet colour

5. In the following reaction $HC \equiv CH \xrightarrow[\text{HgSO}_4]{\text{H}_2\text{SO}_4} X$ Product 'X' will not give

(a) Iodoform test   (b) Tollen's test   (c) Fehling solution test   (d) Victor meyer test

6. $CH_3 - CHO + CO \xrightarrow{\text{Rh.Ir complex}} ?$

(a) Polypropylene   (b) butan-1-al   (c) acetic acid   (d) Acetate

7. The number of electrons that have a total charge of 9550 coulomb is

(a) 6.022×10^{22} (b) 6.22×10^{23} (c) 6.022×10^{-34} (d) 6.022×10^{24}
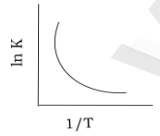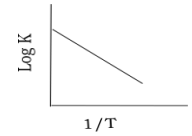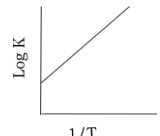
8. Which one of the following is correctly matched?

1) Emulsion	(i) Whipped cream
2) Gel	(ii) Ink
3) foam	(iii) Cream
4) Sol	(iv) Butter

(a) 1) –(iv) , 2)(iii) ,3)-(ii) , 4)-(i)   (b) 1) –(iii) , 2)(i) ,3)-(ii) , 4)-(iv)

(c) 1) –(ii) , 2)(i) ,3)-(iv) , 4)-(iii)   (d) 1) –(iii) , 2)(iv) ,3)-(i) , 4)-(ii)

9. Among the following graphs showing variation of rate constant with temperature (T) for a reaction, the one that exhibits Arrhenius behavior over the entire temperature range is

a)   b)   c)   d) both (b) and (c)

10. Which one of the following compounds is not formed?

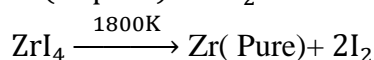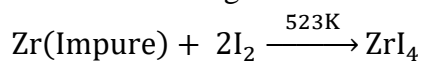(a) XeF_2 (b) $XeOF_4$ (c) NeF_2 (d) XeO_3

11. The phenomenon observed when a beam of light is passed through a colloidal solution is

(a) Coagulation   (b) Catophoresis   (c) Tyndall effect   (d) Electro osmosis

12. In $K_4[Fe(CN)_6]$, the coordination number of Fe^{2+} is

(a) 4   (b) 2   (c) 3   (d) 6

13. The following set of reactions are used in refining Zirconium

$Zr(Impure) + 2I_2 \xrightarrow{523K} ZrI_4$

$ZrI_4 \xrightarrow{1800K} Zr(Pure) + 2I_2$

This method is known as

a) Zone refining   b) Liquation

c) Mond's process   d) van Arkel process

14. Which of the following is not sp^2 hybridized?

(a) Fullerene   (b) Graphite   (c) Diamond   (d) Graphene

15. IUPAC name for the amine $NH_2 - CH_2 - (CH_2)_4 - CH_2 - NH_2$

(a) Heptane-1,7-diamine   (b) Hexamethylene diamine

(c) Hexane-1,6-amine   (d) Hexane-1,6-diamine

PART – II

Note: Answer any six questions. Question No. 24 is compulsory. $6 \times 2 = 12$

16. Give Uses of Borax

17. Why d-block elements have variable oxidation state.

18. Define unit cell

19. State Ostwald dilution law

20. Define Equivalent conductance

21. Explain any two Factors affecting electrolytic conductanc

22. What is meant by electro osmosis?

23. Write a note on peptide bond

24. From the following reaction. Identify A and B
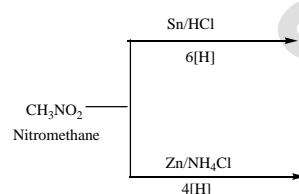
PART – III

Note: Answer any six questions. Question No. 33 is compulsory. $6 \times 3 = 18$

25. What is meant by the term "coordination number"? What is the coordination number of atoms in a bcc structure?

26. What are inter halogen compounds? Give examples

27. Give the Difference between double salt and coordination compounds

28. Mention the factors responsible for Anomalous properties of the first elements of p – block

29. State Faraday's Laws of electrolysis

30. How are the following conversion effected?

(i) ethylene glycol → acetaldehyde   (ii) glycerol → acrolein

31. Give the test for carboxylic acid

32. Give any three differences between DNA and RNA

33. Classify the following solids (i) Diamond (ii) Brass (iii) NaCl (iv) Naphthalene (v) Glucose (vi) SiO_2

PART – IV

Note: Answer all the questions. $5 \times 5 = 25$

34. (a) Explain froth floatation

OR

(b) (i) Explain bleaching action of sulphur dioxide

(ii) Give any two uses of helium.

35. a) (i) What are interstitial compounds?

(ii) Calculate the number of unpaired electrons in Ti^{3+} , Mn^{2+} and calculate the spin only magnetic moment

OR

(b) (i) Explain limitations of VB theory

(ii) Based on the VB theory, explain why $[Ni(CN)_4]^{2-}$ is diamagnetic

36. a) (i) Write any two Differences between rate and rate constant of a reaction

(ii) Derive integrated rate law for a zero order reaction A→ product

OR

(b) (Find the pH of a buffer solution containing 0.20 mole per litre sodium acetate and 0.18 mole per litre acetic acid. K_a for acetic acid is 1.8×10^{-5}

37. a) How will you convert benzaldehyde into following compounds (i) Benzoin (ii) cinnamic acid (iii) malachite green

OR

(b) (i) How will you differentiate primary,secondary and tertiary alcohols by Lucas test?

(ii) Give the uses of diethyl ether

38. a) Describe adsorption theory of catalysis

OR

(b) A compound 'A' of molecular formula C_2H_3N on reduction with $Na(Hg)/C_2H_5OH$ gives 'B'with molecular formula C_2H_7N which undergoes carbylamine test.Compound 'B' on reaction with nitrous acid gives compound 'C' of molecular formula C_2H_6O by liberating nitrogen.Identify A,B,C

1. d	2. a	3. d	4. d	5. d	6. c	7. a	8. d	9. b	10. c
11. c	12. d	13. d	14. c	15. d					

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PUBLIC QUESTION PAPER – MAY 22
XII - CHEMISTRY
PART – I

Note: (i) Answer all the questions. $15 \times 1 = 15$

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

1. An element belongs to group 15 and 3rd period of the periodic table, its electronic configuration would be

(a) $1s^2 \, 2s^2 \, 2p^6 \, 3s^2 \, 3p^2$ (b) $1s^2 \, 2s^2 \, 2p^4$ (c) $1s^2 \, 2s^2 \, 2p^6$ (d) $1s^2 \, 2s^2 \, 2p^6 3s^2 3p^3$

2. Bauxite has the composition

(a) $Al_2O_3 . nH_2O$ (b) $FE_2O_3 . 2H_2O$ (c) AL_2O_3 (d) none of these

3. 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) 35 minutes   (b) 20 minutes   (c) 75 minutes   (d) 30 minutes

4. Which of the following reagent can be used to convert nitrobenzene to aniline?

(a) $ZnHg/NaOH$ (b) Zn/NH_4Cl (c) Sn/HCl (d) All of these

5. $OH - CH_2 - CH_2 - OH$ on heating with periodic acid gives

(a) Methanal   (b) Methanoic acid   (c) CO_2 (d) Glyoxal

6. A complex in which the oxidation number of the metal is zero is

(a) $K_4Fe(CN)_6]$ (b) $[Fe(CN)_3(NH_3)]$ (c) $[Fe(CO)_5]$ (d) both (b) and (c)

7. Which of the following can act as Lowry-bronsted acid as well as base?

(a) HPO_4^{2-} (b) HCl (c) Br^- (d) SO_4^{2-}

8. An aqueous solution of borax is

(a) basic   (b) neutral   (c) amphoteric   (d) acidic

9. Which of the following is an example for homogenous catalyst?

(a) Hydrogenation of oil

(b) Manufacture of ammonia by Habers process

(c) Hydrolysis of sucrose in presence of $dil. HCl$

(d) Manufacture of sulphuric acid by contact process

10. Formation of cyanohydrin from acetone is an example of

(a) electrophilic addition   (b) nucleophilic substitution

(c) nucleophilic addition   (d) electrophilic substitution

11. Which of the following oxidation states is most common among the lanthanoids?

(a) $+ 5$ (b) $+ 4$ (c) $+ 3$ (d) $+ 2$

12. Faraday constant is defined as

(a) Charge required to deposit one mole of substance

(b) Charge required by 1 electron

© Charge carried by 6.22×10^{10} electrons

(d) Charge carried by one mole of electrons

13. Which of the following amino acids are achiral?

(a) Proline   (b) Alanine   (c) Glycine   (d) Leucine

14. The crystal with a metal deficiency defect is

(a) ZnO   (b) NaCl   (c) KCl   (d) FeO

15. Fog is colloidal solution of

(a) liquid in gas   (b) solid in gas   (c) gas in liquid   (d) gas in gas

PART – II

Note: Answer any six questions. Question No. 24 is compulsory. $6 \times 2 = 12$

16. What is the difference between minerals and ores

17. Which is more stable Fe^{2+} or Fe^{3+}? Why ?
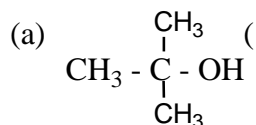
18. Define coordination number

19. Define covalent solids

20. Give examples of first order reaction

21. What are the limitation of Arrhenius concept

22. Write a note on Electrophoresis

23. Give the IUPAC names :

(a)
$$CH_3 - \underset{\underset{CH_3}{|}}{\overset{\overset{CH_3}{|}}{C}} - OH$$
(

(b)

CH$_2$OH

24. Identify A and B in the following reaction

$$CH_3Br \xrightarrow{NAN_3} A \xrightarrow{LIAlH_4} B + N_2$$
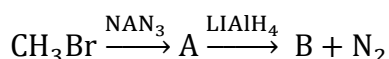
PART – III

Note: Answer any six questions. Question No. 33 is compulsory. $6 \times 3 = 18$

25. What are inter halogen compounds? Give examples

26. What are the properties interstitial compounds

27. Write Arrhenius equation and explains the terms involved

28. What are the Factors affecting electrolytic conductance

29. What is homogenous catalysis? Give example

30. Write any one method for preparation of diethyl ether

31. Write Haloform reaction

32. What are epimers? Give example

33. Write the following for the complex $[Ag(NH_3)_2{}^+$.

(a) Ligand (b) Central metal ion (c) IUPAC name

PART – IV

Note: Answer all the questions.   **$5 \times 5 = 25$**

34.(a) (i) Explain Gravity separation

     (ii) Explain Mond's method for refining nickel

OR

  (b) (i) What are inert pair effect

     (ii) Give the Uses of boric acid

35. (a) (i) What are the uses of oxygen

     (ii) How will you prepare bleaching powder

OR

  (b) Write the postulates of Werner's theory

36. (a) Differentiate crystalline solids and amorphous solids

OR

  (b) (i) Define pH

     (ii) Explain Common ion effect with example

37. (a) Derive an expression for Nernst equation

OR

  (b) What are the characteristics of catalyst?

38. (a) Explain the reducing action of formic acid

OR

  (b) Write a note on

     (i) Carbylamine reaction

     (ii) Gabriel Pthalimide synthesis

1) d	2) a	3) d	4) c	5) a	6) c	7) a	8) a	9) c	10) c
11) c	12) d	13) c	14) d	15) a					

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PUBLIC QUESTION PAPER – JULY 2022
XII - CHEMISTRY
PART – I

Note: (i) Answer all the questions. $15 \times 1 = 15$

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

1. Zinc is obtained from ZnO by
a) Carbon reduction   b) Reduction using silver
c) Electrochemical process   d) Acid leaching

2. The element that does not show catenation among the following p-block elements is
a) Carbon   b) silicon   c) Lead   d) germanium

3. XeF_6 on complete hydrolysis produces
a) $XeOF_4$ b) XeO_2F_2 c) XeO_3 d) XeO_2

4. The actinoid elements which show the highest oxidation state of +7 are
a) Np, Pu ,Am   b) U, Fm, Th   c) U, Th, Md   d) Es, No, Lr

5. An example for double salt
a) $FeSO_4$ b) $FeSO_4(NH_4)_2(SO_4)_3 6H_2O$ c) $K_4[Fe(CN)_6]$ d) $K_2SO_4. 2H_2O$

6. Graphite and diamond are

a) Covalent and molecular crystals   b) ionic and covalent crystals

c) both covalent crystals   d) both molecular crystals

7. Half life period of the first order reaction

$a) \; t_{\frac{1}{2}} = \dfrac{0.6932}{k}$ $b) \; t_{\frac{1}{2}} = \dfrac{k}{0.6932}$

$c) \; t_{\frac{1}{2}} = \dfrac{2.303}{k}$ $d) \; t_{\frac{1}{2}} = \dfrac{k}{2.303}$

8. Which of these is not likely to act as Lewis base?

a) BF_3 b) PF_3 c) CO   d) F^-

9. How many faradays of electricity are required for the following reaction to occur $MnO_4^- \longrightarrow Mn^{2+}$

a) 5F   b) 3F   c) 1F   d) 7F

10. The phenomenon observed when a beam of light is passed through a colloidal solution is

(a) Coagulation   (b) Catophoresis   (c) Tyndall effect   (d) Electro osmosis

11. Which of the following compound can be used as artifreeze in automobile radiators?

a) methanol   b) ethanol   c) Neopentyl alcohol   d) ethan -1, 2-diol

12. Which of the following represents the correct order of acidity in the given compounds

a) $FCH_2COOH > CH_3COOH > BrCH_2COOH > ClCH_2COOH$

b) $FCH_2COOH > ClCH_2COOH > BrCH_2COOH > CH_3COOH$

c) $CH_3COOH > ClCH_2COOH > FCH_2COOH > Br - CH_2COOH$

d) $ClCH_2COOH > CH_3COOH > BrCH_3COOH > ICH_2COOH$

13. Aniline $+$ benzoylchloride $\xrightarrow{\text{NaOH}}$ $C_6H_5 - NH - COC_6H_5$ reaction is known as

a) Friedel – crafts reaction   b) HVZ reaction

c) Schotten – Baumann reaction   d) none of these

14. Which of the following are epimers

a) $D(+)$ − Glucose and $D(+)$ − Galactose   (b) $D(+)$ − Glucose and $D(+)$ − Mannose

c) Neither (a) nor (b)   (d) Both (a) and (b)

15. Which one of the following reduces tollens reagent

a) formic acid   b) acetic acid

c) benzophenone   d) none of these

PART – II

Note: Answer any six questions. Question No. 24 is compulsory. $6 \times 2 = 12$

16. Give the uses of Argon

17. Write a note on Zeigler Natta catalyst.Give its use

18. What are the limitations of VB theory?

19. Define Unit Cell

20. What are Lewis acids and bases? Give an example for each

21. Give the uses of glycerol

22. Write a note on Rosenmund reduction

23. Draw the structure of $D(+)$fructose

24. A solution of silver nitrate is electrolysed for 20 minutes with a current of 2 amperes.Calculate the mass of silver deposited at the cathode

PART – III

Note: Answer any six questions. Question No. 33 is compulsory. $6 \times 3 = 18$

25. Explain acid leaching with example

26. Give Uses of boric acid

27. Write the IUPAC ligand name for the following (a) $C_2O_4^{2-}$ (b) H_2O (c) Cl^-

28. Give the differences between order and molecularity of a reaction.
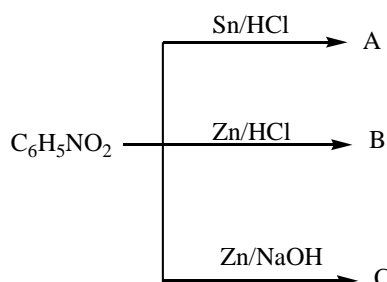
29. What is Buffer solution? Give example

30. What is heterogenous catalysis? Give example

31. Write the bromination reaction of anisole

32. What is Zwitter ion? Give its example

33. Identify compounds A,B,C for the reaction

$$C_6H_5NO_2 \begin{cases} \xrightarrow{\text{Sn/HCl}} A \\ \xrightarrow{\text{Zn/HCl}} B \\ \xrightarrow{\text{Zn/NaOH}} C \end{cases}$$

PART – IV

Note: Answer all the questions. $5 \times 5 = 25$

34. (a) Explain the principle of electrolytic refining with an example

OR

  (b) What is catenation ? Write the conditions for catenation property

35. (a) What are the Properties of inter halogen compounds

OR

  (b) Compare lanthanides and actinides

36. (a) (i) What is packing efficiency?

     (ii)Write a note on Frenkel defect

OR

  (b) Derive integrated rate law for a zero order reaction A→product

37. (a) Derive an expression for Nernst equation

OR

  (b) Describe adsorption theory of catalysis

38. (a) (i)Write the three test for carboxylic acid

     (ii)Write a note on Benzoin condensation

OR

  (b)Write a note on

    (i) Bromination of aniline

    (ii) Mustard oil reaction

1) a	2) c	3) c	4) a	5) b	6) c	7) a	8) a	9) a	10) c
11) d	12) b	13) c	14) d	15) a					

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PUBLIC QUESTION PAPER – MAR 2023
XII - CHEMISTRY
PART – I

Note: (i) Answer all the questions. $15 \times 1 = 15$

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

1. Milk of magnesia is used as _____

a) Tranquilizer   b) Analgesic   c) Antacid   d) Anaesthesia

2. The addition of a catalyst during a chemical reaction alters which of the following quantities?
a) Entropy   b) Internal energy   c) Activation energy   d) Enthalpy

3. The metal extracted by Hall-Heroult Process is

a) Cu   b) Al   c) Zn   d) Ni

4. A magnetic moment of 1.73BM will be shown by one among the following
a) $[CoCl_6]^{4-}$ b) $TiCl_4$ c) $[Cu(NH_3)_4]^{+2}$ d) $[Ni(CN)_4]^{-2}$

5. Which one is correctly matched?

a) Foam – mist

b) Emulsion- Smoke

c) Sol – whipped cream

d) Gel -Butter

6. Which of the following will cause common-ion effect when added to the following dissociation equilibirum reaction?

a) CH_3COCl b) AgCl   c) CH_3Cl d) HCl

7. Carbon atoms in fullerene with formula C_{60} have_____ hybridization

a) sp^2 b) sp^3 c) sp^3d d) sp

8. The most common oxidation state of actinoids is
a) $+4$ b) $+2$ c) $+6$ d) $+3$

9. Asssertion: Hex-4-ennitrile on reaction with Di-isobutyl aluminium hydride followed by hydrolysis gives Hex-4-enal

   Reason: Di-isobutyl aluminium hydride is a selective reducing agent

(a) Assertion is true but reason is false

(b) Both assertion and reason are true and reason is not the correct explanation of assertion

(c) Both Assertion and reason are false

(d) Both assertion and reason are true and reason is not the correct explanation of assertion

10. Which of the following is used as source of gamma rays?
a) Xe   b) Ar   c) Rn   d) Kr

11. The emf of standard hydrogen electrode (SHE) is _____
a) -1.0 b) 0   c) 1.1   d) $+1.0$

12. The crystal with a metal deficiency defect is

a) NaCl   b) AgBr   c) AgCl   d) FeO

13. Which of the following is not present in DNA?

a) Uracil   b) Adenine   c) Cytosine   d) Guanine

14. Which of the following compound can be used as artifreeze in automobile radiators?

a) methanol   b) ethanol   c) ethan -1, 2-diol   d) Glycerol

15. The product formed by the reaction of an aromatic aldehyde with primary amines is

a) Schiff base   b) Carboxylic acid

c) Ketone   d) Aromatic acid

PART – II

Note: Answer any six questions. Question No. 24 is compulsory. $6 \times 2 = 12$

16. Which type of ores can be concentrated by froth floatation method? Give two examples for such ores.

17. Write the uses of silicones

18. Define the term central metal atom in co-ordination compounds

19. Calculate the number of atoms in fcc unit cell

20. What is conjugate acid-base pairs?

21. What are catalytic poison?

22. How will you convert acetone into propane?

23. What are Hormones? Give example

24. Identify A & B in the following reactions $CH_3CH_2NO_2 \xrightarrow{\text{Sn/HCl}} A \xrightarrow{\text{CH}_3\text{COCl}} B$

PART – III

Note: Answer any six questions. Question No. 33 is compulsory. $6 \times 3 = 18$

25. Write a note on Fischer Tropsch synthesis

26. Write the differences between lanthanides and actinides

27. In the complex, $[Pt(NO_2)(H_2O)(NH_3)_2]Br$, identify the following

(a) Central metal atom/ion

(b) Coordination number

(c) Oxidation number of the central metal ion

28. What is Helmholtz double layer?

29. State Faraday's Laws of electrolysis

30. Give the structure of Zwitter ion

31. How will you convert ethyl acetate to ethyl acetoacetate

32. What are food additives? Give two examples

33. Show that in case of first order reaction, the time required for 99% completion is twice the time required for 90% of the reaction.

PART – IV

Note: Answer all the questions. $5 \times 5 = 25$

34. (a) Explain zone refining process

OR

(b) (i) Find the oxidation state of halogen in the following compounds (1) OF_2 (2) I_2O_4

(ii) Complete the following reaction

1) $P_4 + NaOH + H_2O \rightarrow$

2) $XeF_6 + H_2O \rightarrow$

3) $Cu + Conc. H_2SO_4 \rightarrow$
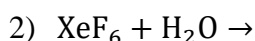
35. (a) (i) Describe the structure of Diborane

(ii) Write ethylborate test

OR

(b) Describe the nature of bonding in metallic carbonyls

36. (a) Explain Schottky defect and Frenkel defect

OR

(b) (i) Give two examples of zero order reaction

(ii) How colloids are used in leather tanning and rubber industry

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

OR

(b) (i) Why Aniline does not undergo Friedel – Crafts reaction?

(ii) How Nylon-2-nylon-6 is prepared?

38. (a) (i) How Malachite green is prepared from Benzaldehyde?

(ii) Write a note on Thrope Nitrile Condensation

OR

(b) Compound (A) of molecular formula C_6H_6O gives purple colour with neutral $FeCl_3$.Compound (A) reacts with ammonia to give compound (B) and it also reacts with Zn dust to give compound (C).Identify (A) , (B) , (C)

1) c	2) c	3) b	4) c	5) d	6) d	7) a	8) d	9) d	10) c
11) b	12) a	13) a	14) c	15) a					

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PUBLIC QUESTION PAPER – JUNE 2023
XII - CHEMISTRY
PART – I

Note: (i) Answer all the questions. $15 \times 1 = 15$

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

1. Match items in column - I with the items of column – II and assign the correct code

	Column – I			Column - 2
A	Cyanide process	(i)		Ultrapure Ge
B	Froth flotation process	(ii)		Extraction of Al
C	Electrolytic refining	(iii)		Dressing of ZnS
D	Zone refining	(iv)		Extraction of Au

(a) 1) –(i) , 2)(ii) ,3)-(iii) , 4)-(iv)   (b) 1) –(ii) , 2)(iv) ,3)-(i) , 4)-(iii)

(c) 1) –(iv) , 2)(iii) ,3)-(ii) , 4)-(i)   (d) 1) –(iii) , 2)(i) ,3)-(iv) , 4)-(ii)

2. In diborane, the number of electrons that accounts for banana bonds is

(a) six   (b) two   (c) four   (d) three

3. On hydrolysis, PCl_3 gives

(a) H_3PO_3 (b) PH_3 (c) H_3PO_4 (d)) $POCl_3$

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

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

5. How many geometrical isomers are possible for $[Pt(Py)(NH_3)(Br)(Cl)]$

(a) 3   (b) 4   (c) 0   (d) 15

6. Graphite and diamond are

a) Covalent and molecular crystals   b) ionic and covalent crystals

c) both covalent crystals   d) both molecular crystals

7. The rate constant of a reaction is 5.8×10^{-2} s^{-1}. The order of the reaction is

(a) First order   (b) zero order   (c) Second order   (d) Third order

8. Which of the following fluro compounds is most likely to behave as a Lewis base?

(a)) BF_3 (b) PF_3 (c) CF_4 (d) SiF_4

9. The number of electrons that have a total charge of 9550 coulomb is

(a) 6.022×10^{23} (b) 6.022×10^{24} (c) 6.022×10^{22} (d) 6.022×10^{-34}

10. Adsorption of a gas on solid metal surface is spontaneous and exothermic, then

a) ΔH increases   b) ΔS increases

c) ΔG increases   d) ΔS decreases

11. Carbolic acid is

(a) Phenol   (b) Picric acid   (c) benzoic acid   (d) phenylacetic acid

12. In the following reaction $HC \equiv CH \xrightarrow[HgSO_4]{H_2SO_4} X$ Product 'X' will not give

a) Tollen's test   b) Victor meyer test

c) Iodoform test   d) Fehling solution test

13. Secondary nitro alkanes react with nitrous acid to form

(a) red solution   (b) blue solution   (c) green solution   (d) yellow solution

14. Which of the following vitamins is water soluble?

(a) Vitamin E   (b) Vitamin K   (c) Vitamin A   (d) Vitamin B

15. Aspirin is a/an

a) acetylsalicylic acid   b) benzoyl salicylic acid

c) chlorobenzoic acid   d) anthranilic acid

PART – II

Note: Answer any six questions. Question No. 24 is compulsory. $6 \times 2 = 12$

16. Give one example for the following

(i) isosagen (ii) chacogen

17. sulphuric acid is a dehydrating agent. Give example

18. What are interstitial compounds?

19. Define half life of a reaction.

20. Give the important characteristics of Physisorption

21. Ethylene glycol $\xrightarrow{Conc.H_2SO_4}$ X. Identify X

22. What is formalin? And its use

23. What are biodegradable polymers? Give two examples

24. Calculate the concentration of OH^-ion in a $frut$ $juice$ $which$ $contains$ $2 \times 10^{-3}M$ H_3O^+ ION. Identify the nature of solution

PART – III

Note: Answer any six questions. Question No. 33 is compulsory. $6 \times 3 = 18$

25. What are the limitations of Ellingham diagram?

26. Give the uses of helium.

27. Mention the oxidation state of the central metal ion, coordination number , nature of ligand for the complex $K_4[Fe(CN)_6]$

28. What are the Differences between rate and rate constant of a reaction

29. Why are lyophobic colloids are stable than lyophobic colloids?

30. Reduction potential of two metals M_1 and M_2 are $E^o_{M_1^{2+}|M_1} = -2.3V$ and $E^o_{M_2^{2+}|M_2} = 0.2V$.

Predict which one is better for coating the surface of iron. Given: $E^o_{Fe^{2+}|Fe} = -0.44V$

31. What happens when the following alkenes are subjective to ozonolysis

32. Write a note on Vulcanization of rubber

33. Identify the compounds A,B,C in the following reaction

$$C_6H_5NO_2 \xrightarrow{\text{Sn/HCl}} A \xrightarrow[273K]{\text{NANO}_3+\text{HCl}} B \xrightarrow{C_2H_5OH} C$$
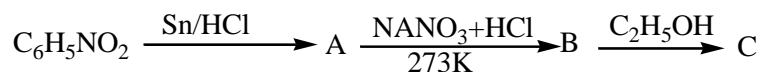
PART – IV

Note: Answer all the questions. $5 \times 5 = 25$

34. (a) (i) .Describe a method for refining nickel / mond process

        (ii) Write about Liquation Process

OR

(b) Write a note on Hydroboration

35. (a) What is lanthanide contraction and what are the effects of lanthanide contraction?

OR

(b) Draw the possible geometrical isomers of the complex $[Co(en)_2Cl_2]^+$

& identify the optically active isomer

36. (a) Differentiate crystalline solids and amorphous solids

OR

(b) Derive integrated rate law for a zero order reaction

37. (a) Explain intermediate compound formation theory of catalysis with an example

OR

   (b) What are the biological importance of proteins?

38. (a) How will you differentiate primary,secondary and tertiary alcohols by Lucas test?

OR

   (b)   Write a short notes on

        (i) Schotten – Baumann reaction

        (ii) Mustard oil reaction

1) c	2) c	3) a	4) b	5) a	6) c	7) a	8) b	9) c	10) d
11) a	12) b	13) b	14) d	15) a					

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