

**HIGHER SECONDARY  
SECOND YEAR**

**GOVT. MODEL QUESTION PAPER**

**XII - STANDARD**

**Chemistry**

Time Allowed: 15 min + 2:30 hrs

Max. Marks: 70

Instructions:

1. Check the question paper for fairness of printing. If there is any lack of fairness, inform the Hall Supervisor immediately.
2. Use Blue (or) Black ink to write and underline use pencil to draw diagrams.

Note: Draw diagrams and write questions wherever necessary.

**PART – I**

**Note: 1. Answer all the questions. 15×1=15**

- 2. Choose the most appropriate answer from the given four alternatives and write the option code and the corresponding answer.**

**1. Which one of the following ore is best concentrated by Froth - floatation method?**

- |              |                |
|--------------|----------------|
| a) Magnetite | b) Haematite   |
| c) Galena    | d) Cassiterite |

**2. Which compound is used as flux in metallurgy?**

- |               |                  |
|---------------|------------------|
| a) Boric acid | b) Borax         |
| c) Diborane   | d) $\text{BF}_3$ |

**3. The shape of  $\text{XeOF}_4$  is**

- |                  |                     |
|------------------|---------------------|
| a) T Shaped      | b) Pyramidal        |
| c) Square planar | d) Square pyramidal |

4. How many moles of acidified  $\text{KMnO}_4$  required to oxidise one mole of oxalic acid?
  - a) 5
  - b) 0.6
  - c) 1.5
  - d) 0.4
5. The type of isomerism exhibited by  $[\text{Pt}(\text{NH}_3)_2\text{Cl}_2]$ ?
  - a) coordination isomerism
  - b) linkage isomerism
  - c) optical isomerism
  - d) geometrical isomerism
6. The fraction of the total volume occupied by the atoms in a fcc is
  - a)  $\frac{\pi}{6}$
  - b)  $\frac{\pi}{3\sqrt{2}}$
  - c)  $\frac{\pi}{4}$
  - d)  $\frac{\sqrt{3}\pi}{8}$
7. The half life period of a radioactive element is 140 days. After 280 days 1g of element will be reduced to which amount of the following?
  - a)  $\frac{1}{4}$
  - b)  $\frac{1}{16}$
  - c)  $\frac{1}{8}$
  - d)  $\frac{1}{2}$
8. Which is not a Lewis base?
  - a)  $\text{BF}_3$
  - b)  $\text{PF}_3$
  - c) CO
  - d)  $\text{F}^-$
9. During electrolysis of molten copper chloride, the time required to produce 0.2 mole of chlorine gas using a current of 2A is
  - a) 32.66 min
  - b) 321.66 min
  - c) 378 min
  - d) 260 min
10. Smoke is a colloidal solution of
  - a) Solid in gas
  - b) Gas in gas
  - c) Liquid in gas
  - d) Gas in liquid

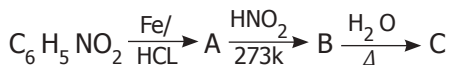
- ## Part - II

**6×2=12**

16. Write a test to identify borate radical.
17. How is pure phosphine prepared from phosphorous acid?
18. What are ionisation isomers? Explain with an example.
19. What is pseudo first order reaction? Give one example.
20. State Faraday's second law of electrolysis.
21. How will you convert glycerol into acrolein?
22. Give any four differences between DNA and RNA.
23. Write short notes on Antioxidants.
24. 50 ml of 0.05 M  $\text{HNO}_3$  is added to 50 ml of 0.025 M KOH. Calculate the pH of the resultant solution.

**Part - III****Answer any six questions. Question No. 33 is compulsory.****6×3=18**

25. Explain the electrometallurgy of aluminium.
26. Give the uses of helium.
27. Explain chromyl chloride Test.
28. A face centred cubic solid of an element (atomic mass  $60 \text{ g mol}^{-1}$ ) has a cube edge of  $4\overset{\circ}{\text{Å}}$ . Calculate its density.
29. Describe the construction of Daniel cell and write its cell reaction.
30. Write short notes on
  - i) Negative catalyst.
  - ii) Phase transfer catalyst.
31. Explain the mechanism of Aldol condensation of acetaldehyde.
32. Explain the preparation of Nylon-6,6 and Buna-S.
33. Identify A to C in the following sequence.

**Part - IV****Answer all the following questions.****5×5=25**

34. a) i) Explain how gold ore is leached by cyanide process.
- ii) Explain the classification of Inosilicates.

**(OR)**

- b) i) What are interhalogen compounds? Give examples.
- ii) Explain the preparation of  $\text{KMnO}_4$ .
35. a) i) Explain  $[\text{Fe}(\text{CN})_6]^{3-}$  is paramagnetic, using Crystal Field theory.
- ii) What is Schottky defect?

**(OR)**

- b) i) Derive Henderson - Hasselbalch equation.  
 ii) What is Kohlraush's law?
36. a) i) Explain Intermediate compound formation theory.  
 ii) Write short notes on ultra filtration.

**(OR)**

- b) How the following conversions are effected?
- i) Phenol  $\rightarrow$  Salicylaldehyde  
 ii) Phenol  $\rightarrow$  Phenolphthalein  
 iii) glycol  $\rightarrow$  1, 4 dioxane
37. a) Write short notes on
- i) Mustard oil reactions  
 ii) Carbylamine reaction  
 iii) Gabriel pathalimide synthesis

**(OR)**

- b) Explain the structure of Fructose.
38. a) i) A first order reaction is 40% complete in 50 minutes. Calculate the value of the rate constant. In what time will the reaction be 80% complete?
- ii)  $K_{sp}$  of  $Ag_2CrO_4$  is  $1.1 \times 10^{-12}$ . What is the solubility of  $Ag_2CrO_4$  in 0.1 M  $K_2CrO_4$ ?

**(OR)**

- b) Compound A of molecular formula  $C_7H_6O$  reduces Tollen's reagent when A reacts with 50% NaOH gives compound B of molecular formula  $C_7H_8O$  and C of molecular formula  $C_7H_5O_2Na$ . Compound C on treatment with dil HCl gives compound D of molecular formula  $C_7H_6O_2$ . When D is heated with sodalime gives compound E. Identify A, B, C, D & E. Write the corresponding equations.

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**MODEL QUESTION PAPER - 1**

**XII - STANDARD**

**Chemistry**

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**PART – I**

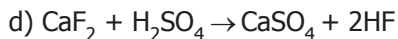
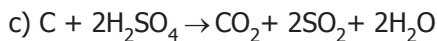
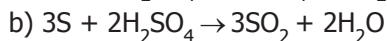
**Note: 1. Answer all the questions. 15×1=15**

**2. Choose the most appropriate answer from the given four alternatives and write the option code and the corresponding answer.**

1. **Metals which do not form carbides with carbon at reduction temperature can be extracted from their oxides by**

a) Reduction by metal	b) Reduction by hydrogen
c) Reduction by carbon	d) Auto reduction
2. **The element that does not show catenation among the following p-block elements is**

a) Carbon	b) silicon
c) Lead	d) germanium
3. **Hot concentrated  $\text{H}_2\text{SO}_4$  is moderately strong oxidising agent which of the following reactions does not show oxidising behaviour ?**



4. **Assertion :  $\text{Ce}^{4+}$  is used as an oxidizing agent in volumetric analysis.**

**Reason :  $\text{Ce}^{4+}$  has the tendency of attaining +3 oxidation state.**

- a) Both assertion and reason are true and reason is the correct explanation of assertion.  
 b) Both assertion and reason are true but reason is not the correct explanation of assertion.  
 c) Assertion is true but reason is false.  
 d) Both assertion and reason are false.

5. **In Calcium fluoride, having the fluorite structure the coordination number of  $\text{Ca}^{2+}$  ion and  $\text{F}^-$  Ion are**

- a) 4 and 2  
 b) 6 and 6  
 c) 8 and 4  
 d) 4 and 8

6. **Structural formula of tetra aquadichloridochromium (III) Chloride.**

- a)  $[\text{Cr}(\text{H}_2\text{O})_4\text{Cl}_2]\text{Cl}_2$   
 b)  $[\text{Cr}(\text{H}_2\text{O})_4\text{Cl}_3]$   
 c)  $[(\text{H}_2\text{O})_4\text{Cl}_2\text{Cr}]\text{Cl}_2$   
 d)  $[\text{Cl}_2(\text{H}_2\text{O})_4\text{Cr}]\text{Cl}_3$

7. **For the second order reaction  $t \propto \frac{1}{a}$**

- a)  $\frac{1}{a^2}$   
 b)  $\frac{1}{a}$   
 c) constant  
 d) a

8. **For two acids A and B,  $K_a$  values at  $25^\circ\text{C}$  are  $2 \times 10^6$  and  $1.8 \times 10^{-4}$  respectively. Which among the following is true with respect to the above data?**

- a) A and B are equally acidic  
 b) A is stronger than B

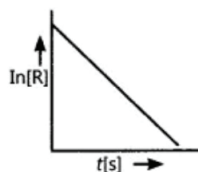
- c) B is stronger than A  
d)  $K_a$  value is not a measure of acid strength
- 9. Zinc can be coated on iron to produce galvanized iron but the reverse is not possible. It is because**
- a) Zinc is lighter than iron  
b) Zinc has lower melting point than iron  
c) Zinc has lower negative electrode potential than iron  
d) Zinc has higher negative electrode potential than iron
- 10. Which of the following is not a favourable condition for physical adsorption?**
- a) high pressure  
b) negative  $\Delta H$   
c) higher critical temperature of adsorbate  
d) high temperature
- 11. Which one of the alcohol cannot be prepared by Grignard reagent?**
- a) Methanol  
b) Ethanol  
c) Isopropyl alcohol  
d) Phenyl methanol
- 12. A compound 'X' when mixed with ethanol and a drop of concentrated  $H_2SO_4$  gave a compound with fruity odour. Identify 'X'.**
- a)  $HCHO$   
b)  $CH_3OH$   
c)  $CH_3COOH$   
d)  $CH_3NH_2$
- 13. 1-nitrobutane and 2-methyl-1-nitropropane are belong to**
- a) position isomerism  
b) functional isomerism  
c) tautomerism  
d) chain isomerism
- 14. Starch when heated with enzyme diastase yields**
- a) glucose  
b) sucrose  
c) maltose  
d) glycogen

**15. Oxidation of fats and oils is prevented by**

- a) BHT (Butylated Hydroxy Toluene)
- b) BHA (Butylated Hydroxy Anisole)
- c) Both (a) and (b)
- d) neither (a) nor (b)

**Part - II****Answer any six questions. Question No. 24 is Compulsory.****6×2=12**

16. In the extraction of metal ore is first converted into metal oxide before reduction into metal. Why?
17. Write the reason for the anomalous behaviour of Nitrogen.
18. In a tetrahedral crystal field, draw the figure to show splitting of d orbitals.
19. Define buffer index.
20. While separating a mixture of ortho and para nitrophenols by steam distillation, name the isomer which will be steam volatile. Give reason.
21. Explain Popoff's rule.
22. Draw the structure of the following compounds.
  - i) Tribenzylamine
  - ii) N-ethyl-N-methylhexan-3-amine
23. Why vitamin C cannot be stored in body?
24. For a chemical reaction  $A \rightarrow B$ , the variation in the concentration  $\ln[A]$  vs time  $t$  plot is given. For this reaction
  - i) What is order of reaction?
  - ii) What is unit of rate constant  $k$ ?

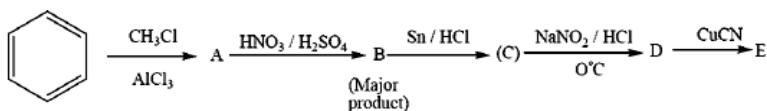


**Part - III**

**Answer any six questions. Question No. 33 is compulsory.**

**6×3=18**

25. How is potash alum prepared?
26. Compare the ionization enthalpies of first series of the transition elements.
27. Distinguish between hexagonal close packing and cubic close packing.
28. Write the chemistry of recharging the lead storage battery, highlighting all the materials that are involved during recharging.
29. Explain shortly about phase transfer catalysis with example.
30. How will you differentiate primary, secondary and tertiary alcohols by Lucas test.
31. How are the following conversions effected
  - i) benzaldehyde into malachite green?
  - ii) ethyne into acetaldehyde?
32. What are the biological importance of proteins?
33. Identify A to E in the following frequency of reactions.



**Part - IV**

**Answer all the following questions.**

**5×5=25**

34. a) i) Explain about Van-Arkel method for refining zirconium/titanium.
- ii)  $\text{AlCl}_3$  behaves like a lewis acid. Substantiate this statement.

**(OR)**

- b) i) Explain about Manufacture of sulphuric acid by contact process and write the conditions to maximize the yield of sulphuric acid.
- ii) Compare lanthanides and actinides. (any four)
35. a) i) Write the oxidation state, coordination number, nature of ligand, and d-orbital occupation (electronic configuration) for the complex i)  $[\text{Ni}(\text{CN})_4]^{2-}$  ii)  $\text{K}_3[\text{Co}(\text{C}_2\text{O}_4)_3]$
- ii) Calculate the number of atoms in a fcc and bcc unit cell.

**(OR)**

- b) i) Derive integrated rate law for a first order reaction  $\text{A} \rightarrow \text{product}$ .
- ii) State and explain Faraday's laws of electrolysis. What is Electrochemical equivalent?
36. a) How are the following conversion carried out?
- i) Benzyl chloride  $\rightarrow$  Benzyl alcohol
- ii) Ethyl magnesium chloride  $\rightarrow$  Propan-1-ol
- iii) Methyl magnesium bromide  $\rightarrow$  2-Methylpropan-2-ol

**(OR)**

- b) What happens when nitrous acid reacts with
- i) Aniline
- ii) N-methylamine
- iii) Trimethyl amine
- iv) N, N-dimethyl aniline
37. a) i) Distinguish between glucose and fructose.
- ii) Explain the classification of lipids.

**(OR)**

- b) Explain the mechanism of cleansing action of soaps and detergents.



38. a) Calculate the  $p^H$  of a buffer solution consisting of 0.4 M  $CH_3COOH$  and 0.4 M  $CH_3COONa$ . What is the change in the  $p^H$  after adding 0.01 mol of HCl to 500 ml of the above buffer solution. Assume that the addition of HCl causes negligible change in the volume. Given: ( $K_a = 1.8 \times 10^{-5}$ )

(OR)

- b) An organic compound (A) of molecular formula  $C_3H_6O$  on reduction with  $LiAlH_4$  gives (B). Compound (B) gives blue colour in Victor Meyer's test and also form a Chloride (C) with  $SOCl_2$ . The Chloride on treatment with alcoholic KOH gives (D). Identify the compounds A, B, C and D. Explain the reactions.

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**MODEL QUESTION PAPER - 2****XII - STANDARD****Chemistry**

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**PART – I****Note: 1. Answer all the questions.  $15 \times 1 = 15$** 

- 2. Choose the most appropriate answer from the given four alternatives and write the option code and the corresponding answer.**

- 1. Wolframite ore is separated from tinstone by the process of**

- |             |                               |
|-------------|-------------------------------|
| a) Smelting | b) Calcination                |
| c) Roasting | d) Electromagnetic separation |

- 2. When boric acid reacted with ethyl alcohol in presence of Conc. sulphuric acid it gives**

- |                  |                     |
|------------------|---------------------|
| a) Borax         | b) trialkylborate   |
| c) Sodium borate | d) Octahedral borax |

- 3. The correct order of the thermal stability of hydrogen halide is**

- |  |  |
|--|--|
| a) $\text{HI} > \text{HBr} > \text{HCl} > \text{HF}$ | b) $\text{HF} > \text{HCl} > \text{HBr} > \text{HI}$ |
| c) $\text{HCl} > \text{HF} > \text{HBr} > \text{HI}$ | d) $\text{HI} > \text{HCl} > \text{HF} > \text{HBr}$ |

4. **Sc (Z=21) is a transition element but Zinc (Z=30) is not because**
- both  $\text{Sc}^{3+}$  and  $\text{Zn}^{2+}$  ions are colourless and form white compounds.
  - in case of Sc, 3d orbital are partially filled but in Zn these are completely filled
  - last electron as assumed to be added to 4s level in case of zinc
  - both Sc and Zn do not exhibit variable oxidation states.
5. **The spin only magnetic moment of  $[\text{MnBr}_4]^{2-}$  is 5.9 BM. Geometry of the complex ion is**
- Tetrahedral
  - Octahedral
  - Square planar
  - Pentagonal pyramidal
6. **The ratio of close packed atoms to tetrahedral hole in cubic packing is**
- 1 : 1
  - 1 : 2
  - 2 : 1
  - 1 : 4
7.  $2\text{N}_2\text{O}_5 \rightarrow \text{NO}_2 + \text{O}_2$ ,  $\frac{d[\text{N}_2\text{O}_5]}{dt} = k_1[\text{N}_2\text{O}_5]$ ,  $\frac{d[\text{NO}_2]}{dt} = k_2[\text{N}_2\text{O}_5]$  and  $\frac{d[\text{O}_2]}{dt} = k_3[\text{N}_2\text{O}_5]$ , the relation between  $k_1$ ,  $k_2$  and  $k_3$  is
- $2k_1 = 4k_2 = k_3$
  - $k_1 = k_2 = k_3$
  - $2k_1 = k_2 = 4k_3$
  - $2k_1 = k_2 = k_3$
8. **Addition of sodium chloride to a saturated solution of silver chloride**
- dissociation of AgCl increases.
  - concentration of  $\text{Cl}^-$  decreases.
  - dissociation of  $\text{AgCl}^-$  decreases.
  - concentration of  $\text{Ag}^+$  increases.

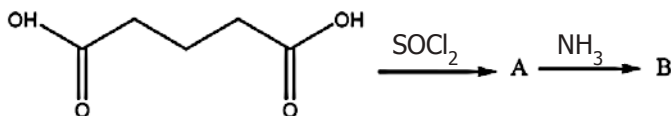


**Part - II**

**Answer any six questions. Question No. 24 is Compulsory.**

**6×2=12**

16. Explain Mc Afee Process.
17. The outer electronic configuration of Cu is  $3d^{10} 4s^1$  instead of  $3d^9 4s^2$ . Why?
18. Write about impurity defect.
19. What are the Limitations of Arrhenius concept?
20. Derive the relationship between Gibb's free energy change and the cell potential.
21. Write a note on catalytic poison.
22. Write about Test to differentiate alcohol and phenols.
23. Low level of noradrenaline is the cause of depression. What types of drugs are needed to cure this problem?
24. Identify A, B, C.

**Part - III**

**Answer any six questions. Question No. 33 is compulsory.**

**6×3=18**

25. Explain the electrometallurgy of aluminium.
26. Show that sulphuric acid is an oxidising agent.
27. Give the difference between double salts and coordination compounds.
28. Derive an expression for the hydrolysis constant of salt of strong acid and weak base.

29. Explain the following with an example.
- Swern oxidation.
  - Schotten - Baumann reaction.
30. What is urinary antiseptic ? How will you prepare and write down its structure?
31. Write a short note on
- Thrope nitrile condensation.
  - Levine and hauser" acetylation.
  - Baltz – schiemann reaction.
32. Give any six difference between DNA and RNA.
33. Hydrolysis of methyl acetate in aqueous solution has been studied by titrating the liberated acetic acid against sodium hydroxide. The concentration of an ester at different temperatures is given below.

t (min)	0	20	40	60	$\infty$
V (mL)	20.2	25.6	29.5	32.8	50.4

So that above the reaction follows pseudo first order reaction as the concentration of water remains constant.

### Part - IV

**Answer all the following questions.**

**5×5=25**

34. a) i) How will you convert metal into metal oxide by roasting and calcination?
- ii) What are the Properties of inter halogen compounds?

**(OR)**

- b) i) Explain about the effects of lanthanide contraction.
- ii) Distinguish crystalline and amorphous solids.
35. a) i) Write a short note on anomalous properties of the first element of p-block.
- ii) What is spectrochemical series? Explain the difference between a weak field ligand and strong field ligand.

**(OR)**

- b) Explain about factors affecting the rate of the reaction.
36. a) i) Derive Henderson – Hasselbalch equation to find pH of the buffer solution.
- ii) What is the difference between a sol and a gel?

**(OR)**

- b) i) Explain about reduction of nitrobenzene in acidic medium.
- ii) What is Mitomycin C? Write down its structure and explain its uses.
37. a) i) What is Zwitter ion? Give its structure.
- ii) Describe the Importance of carbohydrates.

**(OR)**

- b) Identify the polymer and write the reaction involved.
- i) Buta-1,3-diene and styrene in the presence of sodium.
- ii) 3-hydroxy butanoic acid and 3-hydroxy pentanoic acid.
- iii) adipic acid and hexamethylene – diamine.
38. a) For the cell  $\text{Mg}_{(s)} | \text{Mg}^{2+}_{(aq)} || \text{Cu}^{2+}_{(aq)} | \text{Cu}_{(s)}$ ,  
Calculate the equilibrium constant at 25°C and maximum work that can be obtained during operation of cell.

Given  $E^{\circ}_{\text{Mg}^{2+} | \text{Mg}} = +2.37 \text{ V}$        $E^{\circ}_{\text{Cu}^{2+} | \text{Cu}} = 0.80 \text{ V}$

**(OR)**

- b) An organic compound (A) of molecular formula  $\text{C}_6\text{H}_6$  on reaction with propylene gives (B) in presence of  $\text{H}_3\text{PO}_4$  at 532° K. (B) on air oxidation gives (C) of molecular formula  $\text{C}_9\text{H}_{12}\text{O}_2$ . (C) on acidification with  $\text{H}_2\text{SO}_4$  gives (D). Identify A, B, C, D.

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**MODEL QUESTION PAPER - 3****XII - STANDARD****Chemistry**

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**PART – I****Note: 1. Answer all the questions.  $15 \times 1 = 15$** 

2. Choose the most appropriate answer from the given four alternatives and write the option code and the corresponding answer.

1. In the extraction of copper from its sulphide ore, the metal is finally obtained by the reduction of cuprous oxide with

- a) Iron sulphide (FeS)                      b) Carbon monoxide (CO)  
c) Copper (I) sulphide (Cu<sub>2</sub>S)   d) Sulphur dioxide (SO<sub>2</sub>)

2. The stability of +1 oxidation state increases in the sequence

- a) Al < Ga < In < Tl                      b) Tl < In < Ga < Al  
c) In < Tl < Ga < Al                      d) Ga < In < Al < Tl

3. When copper is heated with conc. HNO<sub>3</sub> it produces

- a) Cu(NO<sub>3</sub>)<sub>2</sub> and N<sub>2</sub>O                      b) Cu(NO<sub>3</sub>)<sub>2</sub> and NO<sub>2</sub>  
c) Cu(NO<sub>3</sub>)<sub>2</sub> and NO                      d) Cu(NO<sub>3</sub>)<sub>2</sub> NO and N<sub>2</sub>O

4. **Ce(Z=58) and Yb (Z=70) Exhibits stable +1 and +2 oxidation states respectively. This is because**
- a)  $\text{Ce}^{4+}$  and  $\text{Yb}^{2+}$  acquire  $f^7$  configuration
  - b)  $\text{Ce}^{4+}$  and  $\text{Yb}^{2+}$  acquire  $f^0$  configuration
  - c)  $\text{Ce}^{4+}$  and  $\text{Yb}^{2+}$  acquire  $f^7$  and  $f^{14}$  configuration
  - d)  $\text{Ce}^{4+}$  and  $\text{Yb}^{2+}$  acquire  $f^0$  and  $f^{14}$  configuration
5. **IUPAC name of  $\text{H}_2[\text{PtCl}_6]$  is**
- a) Hexachloridoplatinum (IV) acid
  - b) Hexachloridoplatinum (IV) acid
  - c) Hexachloridoplatinic (IV) acid
  - d) Dihydrogen hexachloropletinate (IV)
6. **Percentage of free space (vacant) in Simple cubic , Body centered, Face centered cubic unit cell (Cubic close packing) are**
- a) 47.69 % , 32 % , 26 %
  - b) 47.69 % , 30 % , 26 %
  - c) 48.69 % , 32 % , 26 %
  - d) 47.69 % , 32 % , 28 %
7. **A zero order reaction X Product, with an initial concentration 0.02 M has a half life of 10 min. if one starts with concentration 0.04 M, then the half life is**
- a) 10 s
  - b) 5 min
  - c) 20 min
  - d) cannot be predicted using the given information
8. **The condition for a compound to be precipitated is**
- a) Ionic product = solubility product
  - b) Ionic product < solubility product
  - c) Ionic product > solubility product
  - d) Ionic product <= solubility product

- 9. For the given cell  $\text{Cr}_{(s)} | \text{Cr}^{3+}_{(aq)} || \text{Cu}^{2+}_{(aq)} | \text{Cu}_{(s)}$  which is correct?**
- Cr is the anode
  - Cu is the anode
  - Overall cell reaction is  $2\text{Cr}^{3+}_{(aq)} + 3\text{Cu}_{(s)} \rightarrow 2\text{Cr}_{(s)} + 3\text{Cu}^{2+}_{(aq)}$
  - Both (b) and (c)
- 10. In physisorption adsorbent does not show specificity for any particular gas because**
- involved Vander Waals forces are universal.
  - gases involved behave like ideal gases.
  - enthalpy of adsorption is low.
  - it is a reversible process.
- 11. 1-propanol and 2-propanol can be best distinguished by**
- oxidation with  $\text{KMnO}_4$  followed by reaction with Fehling solution.
  - oxidation with acidic dichromate followed by reaction with Fehling solution.
  - oxidation by heating with copper followed by reaction with Fehling solution.
  - oxidation with concentrated  $\text{H}_2\text{SO}_4$  followed by reaction with Fehling solution
- 12. The common name of  $\text{CH}_3 - \text{CH} = \text{CH} - \text{CHO}$**
- acraldehyde
  - crotonaldehyde
  - cinnamaldehyde
  - isobutyraldehyde
- 13. The reagent used in the conversion of acetaldoxime to nitro ethane ( $1^\circ$ ) is**
- aqueous  $\text{KMnO}_4$
  - trifluoro peroxy acetic acid
  - alcoholic KOH
  - Conc.  $\text{HNO}_3$
- 14. The one which acts as a shock absorber and lubricant.**
- glycogen
  - ribose
  - starch
  - hyaluronate

**15. The drug that binds to the receptor site and inhibits its natural function are called**

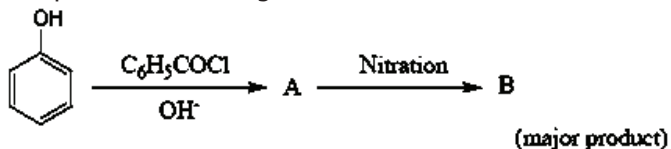
- a) anomers  
b) agonists  
c) antagonists  
d) none of the above

## Part - II

**Answer any six questions. Question No. 24 is Compulsory.**

$$6 \times 2 = 12$$

16. How will you refine the low boiling volatile metals?
17. What is inert pair effect?
18. Why Metal carbonyls are much more stable than normal complexes?
19. Give the examples for first order reaction.
20. Express the relation among cell constant, resistance of the solution in the cell and the conductivity of the solution. How is the conductivity is related to its molar conductivity?
21. Do the vital functions of the body such as digestion get affected during fever?
22. How will you prepare chloropicrin?
23. Draw the structure of sucrose.
24. Complete the following reactions.



### Part - III

**Answer any six questions. Question No. 33 is compulsory.**

$$6 \times 3 = 18$$

25. Give the structure of CO and CO<sub>2</sub>.
26. Describe the variable oxidation state of 3d series elements.

27. Give the differences between rate of a reaction & rate constant of the reaction.
28. Derive an expression for Ostwald's dilution law.
29. How does tertiary alcohol undergoes dehydration to alkene with a mechanism?
30. Explain Cannizaro reaction with mechanism.
31. How is terylene prepared?
32. Write a short note on peptide bond with example.
33. KF crystallizes in fcc structure like sodium chloride. Calculate the distance between  $K^+$  and  $F^-$  in KF.  
(Given Density of KF is  $2.48 \text{ g cm}^{-3}$ )

#### Part - IV

**Answer all the following questions.**

**5×5=25**

34. a) i) Explain froth floatation method. (Diagram not necessary)  
ii) How is inorganic benzene prepared?

**(OR)**

- b) i) Explain the action of nitric acid on metals with one example.  
ii) Explain the rate determining step with an example.
35. a) i) Describe the preparation of potassium dichromate.  
ii) What are the general characteristics of ionic solids.

**(OR)**

- b) i) What is meant by stability of a coordination of compound in solution? State the factors which govern stability of complexes.  
ii) Explain how colloids are prepared by Condensation Methods. (any three)
36. a) How will you differentiate primary, secondary and tertiary alcohols by Victor's meyer test?

(OR)

- b) How are the following conversions effected
- i) propanal into butanone?
  - ii) hex-3-yne into hexan-3-one?
  - iii) phenylmethanal into benzoin?
37. a) Write short notes on the following.
- i) Gabriel phthalimide synthesis.
  - ii) Hofmann's bromide reaction.
  - iii) Mustard oil reaction.

(OR)

- b) i) How will you confirm the presence of aldehyde group in glucose?
- ii) Explain the preparation of bakelite and give its use.
38. a)  $8.2 \times 10^{12}$  litres of water is available in a lake. A power reactor using the electrolysis of water in the lake produces electricity at the rate of  $2 \times 10^6 \text{ Cs}^{-1}$  at an appropriate voltage. How many years would it take to completely electrolyse the water in the lake. Assume that there is no loss of water except due to electrolysis.

(OR)

- b) A Compound (A) with molecular formula  $\text{C}_2\text{H}_3\text{N}$  on acid hydrolysis gives (B) which reacts with thionylchloride to give compound (C). Benzene reacts with compound (C) in presence of anhydrous  $\text{AlCl}_3$  to give compound (D). Compound (C) on reduction with gives (E). Identify (A), (B), (C), (D), (E). Write the equations.

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## MODEL QUESTION PAPER - 4

### XII - STANDARD

#### Chemistry

Time Allowed: 15 min + 2:30 hrs

Max. Marks: 70

Instructions:

1. Check the question paper for fairness of printing. If there is any lack of fairness, inform the Hall Supervisor immediately.
2. Use Blue (or) Black ink to write and underline use pencil to draw diagrams.

Note: Draw diagrams and write questions wherever necessary.

#### PART – I

**Note: 1. Answer all the questions.  $15 \times 1 = 15$**

**2. Choose the most appropriate answer from the given four alternatives and write the option code and the corresponding answer.**

1. **Extraction of gold and silver involves leaching with cyanide ion. silver is later recovered by**

a) Distillation	b) Zone refining
c) Displacement with zinc	d) Liquation
2. **The compound used in eye drops and antiseptics is**

a) boron nitride	b) boric acid
c) sodium metaborate	d) boron trioxide
3. **The molarity of given orthophosphoric acid solution is 2M its Normality is**

a) 6N	b) 4N
c) 2N	d) none of these

4. The reaction of aqueous  $\text{KMnO}_4$  with  $\text{H}_2\text{O}_2$  in acidic condition gives
- a)  $\text{Mn}^{4+}$  and  $\text{MnO}_2$                       b)  $\text{Mn}^{4+}$  and  $\text{O}_2$   
c)  $\text{Mn}^{2+}$  and  $\text{O}_2$                       d)  $\text{Mn}^{3+}$  and  $\text{O}_2$
5. An excess of silver nitrate is added to 100ml of a 0.01M solution of pentaquachloridochromium (III) chloride. The number of moles of  $\text{AgCl}$  precipitated would be
- a) 0.02                      b) 0.002  
c) 0.01                      d) 0.2
6. Three atoms P , Q , R crystallize in a cubic solid lattice having P atoms at corners, Q atom at body centre , R atom at face centre .Identify the formula of the compound
- a) PQR                      b)  $\text{PQR}_2$   
c)  $\text{PQ}_2\text{R}$                       d)  $\text{PQR}_3$
7. For a reaction,  $2\text{A} + \text{B} \rightarrow \text{C}$ , the rate of appearance of C at time 't' is  $1.2 \times 10^{-4} \text{ mol L}^{-1} \text{ s}^{-1}$ . identify the rate of reaction.
- a)  $4 \times 10^{-5} \text{ mol L}^{-1} \text{ s}^{-1}$                       b)  $4.5 \times 10^{-1} \text{ mol L}^{-1} \text{ s}^{-1}$   
c)  $3.6 \times 10^{-4} \text{ mol L}^{-1} \text{ s}^{-1}$                       d)  $4 \times 10^{-1} \text{ mol L}^{-1} \text{ s}^{-1}$
8. When the pH of a solution is 2, the hydrogen ion concentration in moles litre<sup>-1</sup> is
- a)  $1 \times 10^{-12} \text{ mol L}^{-1} \text{ s}^{-1}$                       b)  $1 \times 10^{-2} \text{ mol L}^{-1} \text{ s}^{-1}$   
c)  $1 \times 10^{-7} \text{ mol L}^{-1} \text{ s}^{-1}$                       d)  $1 \times 10^{-4} \text{ mol L}^{-1} \text{ s}^{-1}$
9. Assertion : pure iron when heated in dry air is converted with a layer of rust.  
Reason : Rust has the composition  $\text{Fe}_3\text{O}_4$ .
- a) if both assertion and reason are true and reason is the correct explanation of assertion.  
b) if both assertion and reason are true but reason is not the correct explanation of assertion.

- c) assertion is true but reason is false.
- d) both assertion and reason are false.

**10. According to the adsorption theory of catalysis, the speed of the reaction increases because**

- a) Adsorption produces heat which increases the speed of the reaction.
- b) Adsorption lowers the activation energy of the reaction.
- c) The concentration of reactant molecules at the active centres of the catalyst becomes high due to adsorption.
- d) In the process of adsorption, the activation energy of the molecules become large.

**11. Higher alcohols are not soluble in water because of**

- a) hydrophilic alkyl group
- b) hydrophobic alkyl groups
- c) hydrophilic aryl group
- d) hydrophobic aryl groups

**12. Formaldehyde reacts with ammonia to give**

- a)  $(\text{CH}_2)_4\text{N}_6$
- b)  $(\text{CH}_2)_5\text{N}_5$
- c)  $(\text{CH}_2)_6\text{N}_4$
- d)  $(\text{CH}_2)_6\text{N}_3$

**13. Amino group can be directly converted into nitro group by**

- a) Caro's acid
- b) Fuming mixture of  $\text{conc. HNO}_3 + \text{conc. H}_2\text{SO}_4$
- c)  $\text{NaNO}_2 + \text{HCl}$
- d) Ethanolic  $\text{KNO}_2$

**14. Sprouting barley is the main source of \_\_\_\_\_ sugar.**

- a) glucose
- b) fructose
- c) cellulose
- d) maltose

**15. Which of the following is not an example of antacid?**

- a) Histamine
- b) cimetidine
- c) ranitidine
- d) erythromycin

**Part - II****Answer any six questions. Question No. 24 is Compulsory.****6×2=12**

16. How will you identify presence of borate radical?
17. What is Bayer's reagent and write down its use?
18. Explain pseudo first order reaction with example.
19. Identify the conjugate acid base pair for the following HF, H<sub>2</sub>SO<sub>4</sub>, NH<sub>3</sub>, HCOOH.
20. Write the structures of compounds whose IUPAC names as follows.
  - i) 1,1-Phenylpropan-2-ol
  - ii) 3-cyclohexylpentan-3-ol
21. What is Libermann's nitroso test?
22. What are essential and non essential amino acids? Give one example of each type.
23. What are allosteric inhibitors?
24. The diffraction of crystal of barium with X-ray of wave length 2.29Å gives a first order deflection at 30°. What is the distance between the diffracted planes?

**Part - III****Answer any six questions. Question No. 33 is compulsory.****6×3=18**

25. Explain how silver is refined by electrolytic refining.
26. Explain about Holmes signal.
27. On the basis of VB theory explain the nature of bonding in [Co(C<sub>2</sub>O<sub>4</sub>)<sub>3</sub>]<sup>3-</sup>.
28. Write differences between order and molecularity of reaction.
29. Derive an expression for Nernst equation.

30. Explain how colloids are prepared by colloidal mill and peptization.
31. How does glucose react with acetic anhydride and hydroxylamine?
32. How do antiseptics differ from disinfectants?
33. Which of the following compounds would undergo aldol condensation, which the Cannizzaro reaction and which neither?
- |                           |                        |
|---------------------------|------------------------|
| (i) Methanal              | (ii) 2-Methylpentanal  |
| (iii) Benzaldehyde        | (iv) Benzophenone      |
| (v) Cyclohexanone         | (vi) 1-Phenylpropanone |
| (vii) Phenylacetaldehyde  | (viii) Butan-1-ol      |
| (ix) 2, 2-Dimethylbutanal |                        |

#### Part - IV

**Answer all the following questions.**

**5×5=25**

34. a) i) Difference between roasting and calcination.  
ii) Write a note on metallic nature of p-block elements.

**(OR)**

- b) i) How nitric acid is manufactured using Ostwald's process?  
ii) How does the acidic potassium permanganate solution react with (a) Iodide (b) sulphide (c) alcohols. Write the ionic equations for the reactions.

35. a) i) Write the postulates of Werner's theory.  
ii) Write a note on Frenkel defect and metal excess defect.

**(OR)**

- b) i) Explain the buffer action in a basic buffer containing equimolar ammonium hydroxide and ammonium chloride.

ii) Suggest a way to determine the value  $\Delta_m^0$  of water.

36. a) i) How will you convert acetylene into n-butyl alcohol?  
ii) Prove that formic acid is strong reducing agent.

(OR)

- b) i) Write down the classification of Nitro compounds.  
ii) How will you convert benzene diazonium chloride to Benzene, Benzoic acid & iodobenzene
37. a) i) What are the different types of hormones?  
ii) What are the deficiency disease of Vitamin E, Vitamin K, Vitamin B<sub>7</sub>?

(OR)

- b) Explain how Free radical polymerisation occurs.
38. a) Benzene diazonium chloride in aqueous solution decomposes according to the Equation  $C_6H_5N_2Cl \rightarrow C_6H_5Cl + N_2$ . Starting with an initial concentration of  $10.1 \text{ g L}^{-1}$ , the volume of  $N_2$  gas obtained at  $50^\circ\text{C}$  at different intervals of time was found to be as under.

t (min)	6	12	18	24	30	$\infty$
Vol of $N_2$ (ml)	19.3	32.6	41.3	46.5	-50.4	58.3

Show that the above reaction follows the first order kinetics. What is the value of the rate constant?

(OR)

- b) A dibromo derivative (A) on treatment with KCN followed by acid hydrolysis and heating gives a monobasic acid (B) along with liberation of  $\text{CO}_2$ . (B) on heating with liquid ammonia followed by treating with  $\text{Br}_2/\text{KOH}$  gives (C) which on treating with  $\text{NaNO}_2$  and  $\text{HCl}$  at low temperature followed by oxidation gives a monobasic acid (D) having molecular mass 74. Identify A to D.

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## MODEL QUESTION PAPER - 5

### XII - STANDARD

### Chemistry

Time Allowed: 15 min + 2:30 hrs

Max. Marks: 70

Instructions:

1. Check the question paper for fairness of printing. If there is any lack of fairness, inform the Hall Supervisor immediately.
2. Use Blue (or) Black ink to write and underline use pencil to draw diagrams.

Note: Draw diagrams and write questions wherever necessary.

### PART – I

**Note: 1. Answer all the questions. 15×1=15**

**2. Choose the most appropriate answer from the given four alternatives and write the option code and the corresponding answer.**

1. **In the froth-floatation process the collectors such as pine oil and xanthates, etc enhances.**
  - a) Non-wettability of the mineral particles in froth
  - b) Non-wettability of the mineral particles in water
  - c) Non-wettability of the gangue particles in froth
  - d) Non-wettability of the gangue particles in water
2. **The geometry at which carbon atom in diamond are bonded to each other is**
  - a) tetrahedral
  - b) hexagonal
  - c) octahedral
  - d) none of these
3. **Which of the following orders is not in accordance with the property stated against it?**
  - a)  $F_2 > Cl_2 > Br_2 > I_2$  : bond dissociation energy



**10. Which one of the following is an example for homogeneous catalysis?**

- a) manufacture of ammonia by Haber's process
- b) manufacture of sulphuric acid by contact process
- c) hydrogenation of oil
- d) Hydrolysis of sucrose in presence of all HCl

**11. The compound that does not undergo Cannizzaro reaction is:**

- a) Formaldehyde
- b) Acetaldehyde
- c) Benzaldehyde
- d) Trimethyl acetaldehyde

**12. Which order of arrangement is correct in terms of the strength of the acid?**

- a)  $\text{CH}_3\text{-CH}_2\text{COOH} > \text{CH}_3\text{COOH} < \text{HCOOH} < \text{ClCH}_2\text{COOH}$
- b)  $\text{ClCH}_2\text{COOH} < \text{HCOOH} < \text{CH}_3\text{COOH} < \text{CH}_3\text{CH}_2\text{COOH}$
- c)  $\text{CH}_3\text{-CH}_2\text{COOH} < \text{CH}_3\text{COOH} < \text{HCOOH} < \text{ClCH}_2\text{COOH}$
- d)  $\text{HCOOH} > \text{CH}_3\text{CH}_2\text{COOH} < \text{CH}_3\text{COOH} > \text{ClCH}_2\text{COOH}$

**13. The conversion of ethanol into all types of amines by the action of ammonia along with Alumina is**

- a) HVZ reaction
- b) Sabatier-Mailhe method
- c) Carbylamine reaction
- d) Mendius reaction

**14. Starch contains 20% of \_\_\_\_\_ and 80% of \_\_\_\_\_.**

- a) ribulose, amylose
- b) mylopectin, amylose
- c) amylose, amylopectin
- d) amylopectin, ribulose

**15. Which of the following are used for post operative pain and pain of terminal cancer?**

- a) morphine, codeine
- b) ibuprofen, aspirin
- c) methyl salicylate, salicylic acid
- d) histidine, ranitidine

**Part - II****Answer any six questions. Question No. 24 is Compulsory.****6×2=12**

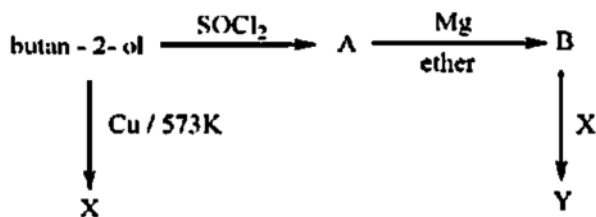
16. Give the limitations of Ellingham diagram.
17. Explain why fluorine always exhibit an oxidation state of  $-1$ ?
18. What is crystal field stabilization energy (CFSE)?
19. Write Arrhenius equation and explains the terms involved.
20. Define ionic product of water. Give its value at room temperature.
21. Prove that amide shows Amphoteric character.
22. Why cannot aromatic primary amines be prepared by Gabriel phthalimide synthesis?
23. Why are cimetidine and ranitidine better antacids than sodium hydrogen carbonate or magnesium or aluminium hydroxide?
24. The same amount of electricity was passed through two separate electrolytic cells containing solutions of nickel nitrate and chromium nitrate respectively. If 2.935 g of Ni was deposited in the first cell. The amount of Cr deposited in the another cell?

Given : molar mass of Nickel and chromium are 58.74 and  $52 \text{ gm}^{-1}$  respectively.

**Part - III****Answer any six questions. Question No. 33 is compulsory.****6×3=18**

25. What is catenation? Describe the catenation property of carbon.
26. Calculate the percentage efficiency of packing in case of body centered cubic crystal.
27. Show that time required for 99% completion is double the time required for the completion of 90% reaction.
28. Explain how rusting of iron is envisaged as setting up of an electro chemical cell.

29. Explain intermediate compound formation theory of catalysis with an example.
30. Explain the Test for Aldehydes.
31. What happens when D-glucose is treated with the following reagents?  
i) HI      ii) Bromine water      iii)  $\text{HNO}_3$
32. Write a note on vulcanization of rubber.
33. Predict the product A, B, X and Y in the following sequence of reaction.



#### Part - IV

**Answer all the following questions.**

**5×5=25**

34. a) i) How will you concentrate the ferromagnetic ores?  
ii) Explain about industrial preparation of carbon monoxide.

**(OR)**

- b) i) Explain about the reducing property of sulphur dioxide.  
ii) Prove that Potassium dichromate is a powerful oxidising agent in acidic medium.
35. a) i) Explain about Coordination isomers and linkage isomerism.  
ii) Write a short note on Schottky and metal deficient defect.

**(OR)**

- b) i) Explain briefly the collision theory of bimolecular reactions.  
ii) Write the differences between lyophobic and lyophilic sol.

36. a) How will you bring about the following conversions in not more than two steps?
- Benzoic acid to m- Nitrobenzyl alcohol
  - Benzaldehyde to Benzophenone
  - Benzene to m-Nitroacetophenone

**(OR)**

- b) i) How will you distinguish between primary secondary and tertiary aliphatic amines?
- ii) Write all possible isomers for the following compounds  $C_3H_7 - NO_2$ .
37. a) i) Enumerate the any four functions of lipids.
- ii) Explain about DNA finger printing process.

**(OR)**

- b) i) How Urea formaldehyde polymer & Nylon-6,6 and Nylon-6 are prepared?
- ii) What are bio degradable polymers? Give examples.
38. a) Calculate the
- hydrolysis constant,
  - degree of hydrolysis and
  - pH of 0.05 M sodium carbonate solution  $pK_a$  for  $HCO_3^-$  is 10.26.

**(OR)**

- b) An organic compound (A) of molecular formula  $C_2H_6O$  on reaction with Conc. $H_2SO_4$  at 443 K gives unsaturated hydrocarbon (B). (B) on treatment with Baeyer's reagent gives (C) of molecular formula  $C_2H_6O$ . (C) on reaction with anhydrous  $ZnCl_2$  gives (D) of formula  $C_2H_4O$  Identify A, B, C, D.

## MODEL QUESTION PAPER - 6

### XII - STANDARD

#### Chemistry

Time Allowed: 15 min + 2:30 hrs

Max. Marks: 70

Instructions:

1. Check the question paper for fairness of printing. If there is any lack of fairness, inform the Hall Supervisor immediately.
2. Use Blue (or) Black ink to write and underline use pencil to draw diagrams.

Note: Draw diagrams and write questions wherever necessary.

#### PART – I

**Note: 1. Answer all the questions. 15×1=15**

**2. 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. **Quartz is an example for ----- type of silicates.**
  - a) inosilicates
  - b) tecto silicates
  - c) amphiboles
  - d) cyclic silicates
3. **Assertion : bond dissociation energy of fluorine is greater than chlorine gas.**  
**Reason : chlorine has more electronic repulsion than fluorine.**

- a) Both assertion and reason are true and reason is the correct explanation of assertion.  
b) Both assertion and reason are true but reason is not the correct explanation of assertion.  
c) Assertion is true but reason is false.  
d) Both assertion and reason are false.
- 4. The reagent used for detecting unsaturation**  
a) Bayer's reagent                      b) Tollen's reagent  
c) Fenton's reagent                      d) Schiff's reagent
- 5. Which is not an anionic complex?**  
a)  $[\text{Cu}(\text{NH}_3)_4]\text{Cl}_2$                       b)  $\text{K}_4[\text{Fe}(\text{CN})_6]$   
c)  $\text{K}_3[\text{Fe}(\text{CN})_6]$                       d)  $[\text{NiCl}_4]^{2-}$
- 6. An example for Frenkel defect is**  
a) NaCl                                      b) AgBr  
c) CsCl                                      d) FeS
- 7. The half life period of a first order reaction is 10 minute. then its rate constant is**  
a)  $6.93 \times 10^2 \text{ min}^{-1}$                       b)  $0.693 \times 10^{-2} \text{ min}^{-1}$   
c)  $6.932 \times 10^{-2} \text{ min}^{-1}$                       d)  $69.3 \times 10^{-1} \text{ min}^{-1}$
- 8. Ostwald's dilution law is applicable in the case of the solution of**  
a)  $\text{CH}_3\text{COOH}$                               b) NaCl  
c) NaOH                                      d)  $\text{H}_2\text{SO}_4$
- 9. If  $0.2 \text{ }^0\text{A}$  can deposit 0.1978 g of copper in 50 minutes, how much of copper will be deposited by 600 coulombs?**  
a) 19.78 g                                      b) 1.978 g  
c) 0.1978 g                                      d) 197.8 g
- 10. The phenomenon observed when a beam of light is passed through a colloidal solution is**  
a) Cataphoresis                              b) Electrophoresis  
c) Coagulation                                      d) Tyndall effect

- 11. The correct order of reactivity of alcohol during dehydration is**
  - a) primary > secondary > tertiary
  - b) primary < secondary < tertiary
  - c) tertiary < secondary < primary
  - d) secondary < tertiary < primary
- 12. Carboxylic acids are more acidic from phenol and alcohol because of**
  - a) intermolecular hydrogen bonding
  - b) formation of dimers
  - c) highly acidic hydrogen
  - d) greater resonance stabilisation of their conjugate base
- 13. The correct order of basic strength in the case of alkyl substituted amines is**
  - a)  $(\text{CH}_3)_2\text{NH} > \text{CH}_3\text{-NH}_2 > (\text{CH}_3)_3\text{N} > \text{NH}_3$
  - b)  $\text{NH}_3 > (\text{CH}_3)_3\text{-N} > \text{CH}_3\text{NH}_2 > (\text{CH}_3)_2\text{NH}$
  - c)  $(\text{CH}_3)_3\text{N} < \text{CH}_3\text{-NH}_2 > \text{NH}_3 < (\text{CH}_3)_2\text{NH}$
  - d)  $(\text{CH}_3)_2\text{NH}_2 < (\text{CH}_3)\text{-N} < \text{NH}_3 > (\text{CH}_3)_2\text{NH}$
- 14. The number of asymmetric carbon atoms present in glucose and fructose are**
  - a) 3, 4                      b) 4, 3                      c) 4, 5                      d) 5, 4
- 15. Which one of the following is used to treat urinary tract infection and respiratory infections?**
  - a) doxycycline    b) karamycin
  - c) ciprofloxacin    d) ibuprofen

### Part - II

**Answer any six questions. Question No. 24 is Compulsory.**

**6×2=12**

16. Write a note on Fischer Tropsch synthesis.
17. Actinoid contraction is greater from element to element than the lanthanoid contraction. Why?

18. If NaCl is doped with  $10^{-2}$  mol percentage of strontium chloride. What is the concentration of cation vacancy?
19. For the reaction  $A \rightarrow B$ . Rate =  $k[A].2[B]$ 
  - i) How is rate of reaction affected if the concentration of A is doubled?
  - ii) What is overall order of reaction if B is present in large excess?
20. Define Gold number.
21. When ketones are undergoes oxidation, the C-C bond is cleaved. When a strong oxidizing agent is used to oxidize 2, 5-dimethyl butan-3-one. Mention the products with their names.
22. What is glycogen? How is it different from starch?
23. Which forces are involved in holding the drugs to the active site of enzymes?
24. 0.44 g of a monohydric alcohol when added to methyl magnesium iodide in ether liberates at STP  $112 \text{ cm}^3$  of methane with PCC the same alcohol form a carbonyl compound that answers silver mirror test. Identify the compound.

### Part - III

**Answer any six questions. Question No. 33 is compulsory.**

**6×3=18**

25. Compare bleaching action of chlorine with sulphuric acid.
26. In the complex,  $[\text{Pt}(\text{NO}_2)(\text{H}_2\text{O})(\text{NH}_3)_2]\text{Br}$ .  
Identify the following:
  - i) Central metal atom/ion
  - ii) Ligand(s) and their types
  - iii) Oxidation number of the central metal ion
  - iv) Coordination number
27. Discuss the Lowery – Bronsted concept of acids and bases.
28. How will you identify the types of emulsion?

29. Explain the following with an example.
- Kolbe's reaction.
  - Riemer - Tiemann reaction.
30. Explain Aldol condensation with mechanism.
31. How are vitamins classified? Name the vitamin responsible for the coagulation of blood and maturation of blood cells.
32. Write a note on antioxidants.
33. For the hydrolysis of methyl acetate in aqueous solution, the following result were obtained.

t (s)	0	30	60
$[\text{CH}_3\text{COOCH}_3]$ mol L <sup>-1</sup>	0.60	0.30	0.15

Show its follows pseudo first order reaction as the concentration of water remains constant.

#### Part - IV

**Answer all the following questions.**

**5 × 5 = 25**

34. a) i) Explain zone refining process with an example.
- ii) How chlorine is manufactured by the electrolysis of brine solution?

**(OR)**

- b) i) Describe the structure of diborane. (diagram not necessary)
- ii) Explain the Cause of lanthanoid contraction.
35. a) i) What are the Main assumptions of Valence bond theory (any five)
- ii) Define half life of a reaction. Show that for a first order reaction half life is independent of initial concentration.

**(OR)**

- b) i) Distinguish tetrahedral and octahedral voids.
- ii) Explain common ion effect with an example.

36. a) i) How does tertiary alcohol is converted into alkyl halide with mechanism?  
ii) How will you prepare Benzoic acid from Phenyl magnesium bromide and benzoic anhydride?

**(OR)**

- b) How will you prepare propanenitrile from  
i) Methyl bromide  
ii) acetaldoximes  
iii) Ammonium acetate  
iv) Acetamide
37. a) Define the following as related to proteins.  
i) Peptide linkage  
ii) Primary structure  
iii) Secondary structure

**(OR)**

- b) Explain about Classification of polymer.
38. a) i) A current of 1.608A is passed through 250 mL of 0.5 M solution of copper sulphate for 50 minutes. Calculate the strength of  $\text{Cu}^{2+}$  after electrolysis assuming volume to be constant and the current efficiency is 100%.  
ii) The solution of a salt of metal was electrolysed for 15 minutes with a current of 0.15 amperes. The mass of the metal deposited at the cathode is 0.783g. calculate the equivalent mass of the metal.

**(OR)**

- b) An organic compound (A) of molecular formula  $\text{C}_6\text{H}_7\text{N}$  on reaction with sodium nitrite and hydrochloric acid gives (B). (B) on treatment with cuprous cyanide gives (C) of molecular formula  $\text{C}_7\text{H}_5\text{N}$ . (C) on reaction with sodium and ethanol gives (D) of formula  $\text{C}_7\text{H}_9\text{N}$ . (D) on reaction with nitrous acid gives (E) of molecular formula  $\text{C}_7\text{H}_8\text{O}$ . Identify A, B, C, D and E.

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## MODEL QUESTION PAPER - 7

### XII - STANDARD

#### Chemistry

Time Allowed: 15 min + 2:30 hrs

Max. Marks: 70

Instructions:

1. Check the question paper for fairness of printing. If there is any lack of fairness, inform the Hall Supervisor immediately.
2. Use Blue (or) Black ink to write and underline use pencil to draw diagrams.

Note: Draw diagrams and write questions wherever necessary.

#### PART – I

**Note: 1. Answer all the questions. 15×1=15**

**2. Choose the most appropriate answer from the given four alternatives and write the option code and the corresponding answer.**

**1. In the extraction of aluminium from alumina by electrolysis, cryolite is added to**

- a) Lower the melting point of alumina
- b) Remove impurities from alumina
- c) Decrease the electrical conductivity
- d) Increase the rate of reduction

**2. Oxidation state of carbon in its hydrides**

- |       |       |
|-------|-------|
| a) +4 | b) -4 |
| c) +3 | d) +2 |

**3. Oxidation states of P in  $H_4P_2O_5$ ,  $H_4P_2O_6$ ,  $H_4P_2O_7$  are respectively**

- |               |               |
|---------------|---------------|
| a) +3, +4, +5 | b) +3, +5, +4 |
| c) +5, +3, +4 | d) +5, +4, +3 |

4. **Equivalent weight of  $\text{KMnO}_4$  in acidic medium is**  
a) 3.16  
b) 31.6  
c) 158  
d) 52.67
5.  **$[\text{FeF}_6]^{4-}$  is paramagnetic because**  
a)  $\text{F}^-$  is a weaker ligand  
b)  $\text{F}^-$  is a strong ligand  
c)  $\text{F}^-$  is a ambidentate ligand  
d)  $\text{F}^-$  is a chelating ligand
6. **Solid  $\text{CO}_2$  is an example of**  
a) covalent solid  
b) metallic solid  
c) molecular solid  
d) ionic solid
7. **How much time will be taken for 20 g to reduce 5 g?  $[\text{R} = 2 \times 10^{-3} \text{ s}^{-1}$  (First order reaction)].**  
a) 693.1 s  
b)  $693.1 \text{ s}^{-1}$   
c) 6.931 s  
d)  $6.931 \text{ s}^{-1}$
8. **The pH of an aqueous solution is Zero. The solution is**  
a) slightly acidic  
b) strongly acidic  
c) neutral  
d) basic
9. **Calculate the standard emf of the cell, provided the standard reduction potentials of cathode and anode are  $-0.763 \text{ V}$  and  $0.80 \text{ V}$ .**  
a)  $-1.563 \text{ V}$   
b)  $0.037 \text{ V}$   
c)  $-0.610 \text{ V}$   
d) None of these
10. **Which among the following does not affect adsorption?**  
a) surface area of the adsorbent  
b) catalyst  
c) temperature  
d) pressure

- 11. Order of reactivity of alcohol towards sodium metal is**  
a) primary < secondary > tertiary  
b) primary > secondary > tertiary  
c) primary < secondary < tertiary  
d) primary > secondary < tertiary
- 12. In the reduction of acetaldehyde using  $\text{LiAlH}_4$  the hydride ion acts as**  
a) electrophile  
b) nucleophile  
c) both (a) and (b)  
d) a free radical
- 13. Liebermann's nitroso reaction is used for testing \_\_\_\_\_.**   
a)  $1^\circ$  amine  
b)  $2^\circ$  amine  
c)  $3^\circ$  amine  
d) all the above
- 14. Which vitamin isn't synthesizes from vegetable?**  
a) cyanocobalamine  
b) pyridoxine  
c) thiamine  
d) tocopherol
- 15. Commonly used antiseptic 'dettol' is a mixture of**  
a) O-chlorophenoxylenol + terpineol  
b) O-cresol + terpineol  
c) phenol + terpineol  
d) chloroxylenol + terpineol

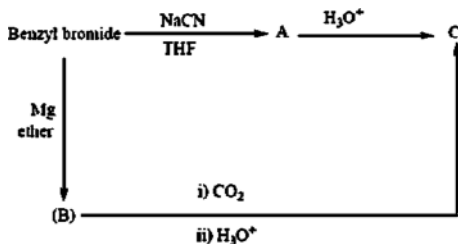
### Part - II

**Answer any six questions. Question No. 24 is Compulsory.**

**6×2=12**

16. What is the difference between minerals and ores?
17. Suggest a reason why HF is a weak acid, whereas binary acids of the all other halogens are strong acids.
18. What are labile and inert complexes?
19. What is buffer solution? Write down its types.

20. How natural honey is distinguished from artificial honey?
21. What is meta merism? Give the structure and IUPAC name of metamers of 2-methoxy propane.
22. Give plausible explanation for each of the following.
  - i) Why are amines less acidic than alcohols of comparable molecular masses?
  - ii) Why do primary amines have higher boiling point than tertiary amines?
23. What are anti fertility drugs? Give examples.
24. Identify A, B and C.



### Part - III

**Answer any six questions. Question No. 33 is compulsory.**

**6×3=18**

25. Give the uses of potassium permanganate.
26. Explain the effect of catalyst on reaction rate with an example.
27. Write the name of the cell used in inverters. Write the reaction taking place at the anode and the cathode of the cell.
28. Describe adsorption theory of catalysis.
29. Starting from glycerol how will you prepare i) Acrolein ii) TNG
30. Write a short note on
  - i) Hell – Volhard – Zelinsky reaction
  - ii) Transesterification

31. Describe the lock & key hypothesis of enzyme action.
32. Name some important categories of food additives.
33. An element has bcc structure with a cell edge of 288 pm. The density of the element is  $7.2 \text{ g cm}^{-3}$ .

### Part - IV

**Answer all the following questions.**

**5×5=25**

34. a) i) Explain how bauxite converted to pure alumina by alkali leaching.
- ii) Write about difference between graphite and diamond.

**(OR)**

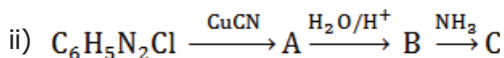
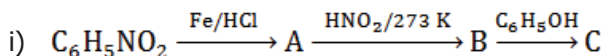
- b) i) Do transition metals form complex coordination compounds.
- ii)  $[\text{Ni}(\text{CN})_4]^{2-}$  is diamagnetic, while  $[\text{NiCl}_4]^{2-}$  is paramagnetic, explain using crystal field theory.
35. a) i) Calculate the percentage efficiency of packing in case of face centered cubic crystal.
- ii) Define rate law and rate constant.

**(OR)**

- b) i) Derive an expression for the degree of hydrolysis and pH of salt of weak base and weak acid.
- ii) How Kohlrausch's Law is useful to determine the molar conductivity of weak electrolyte at infinite dilution.
36. a) How are the following conversions are effected
  - i) Benzaldehyde to Benzal acetone?
  - ii) Acetamide to methyl amine?
  - iii) Acetone to propane?

**(OR)**

- b) Identify compounds A, B, C in the following sequence of reactions



37. a) Elucidate the structure of fructose.

**(OR)**

- b) i) How is low density polythene prepared?  
 ii) How is Nylon-6,6 prepared? Give its use.
38. a) An element A occupies group number 15 and period number 3, reacts with chlorine to give compound B. The compound B on hydrolysis gives a dibasic acid C. The compound C on heating undergoes auto oxidation and reduction to give a tribasic acid. Identify the elements A, compounds B, C and D. Write the reactions.

**(OR)**

- b) An organic compound (A) of molecular formula  $\text{C}_6\text{H}_5\text{Cl}$  on reaction with aqueous NaOH gives (B). (B) on treatment with NaOH gives (C) of molecular formula  $\text{C}_6\text{H}_5\text{ONa}$ . (C) on treatment with  $\text{CO}_2$  followed by acid hydrolysis gives (D). Identify A, B, C, D.

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**MODEL QUESTION PAPER - 8****XII - STANDARD****Chemistry**

Time Allowed: 15 min + 2:30 hrs

Max. Marks: 70

Instructions:

1. Check the question paper for fairness of printing. If there is any lack of fairness, inform the Hall Supervisor immediately.
2. Use Blue (or) Black ink to write and underline use pencil to draw diagrams.

Note: Draw diagrams and write questions wherever necessary.

**PART – I****Note: 1. Answer all the questions.  $15 \times 1 = 15$** 

2. Choose the most appropriate answer from the given four alternatives and write the option code and the corresponding answer.

1. Considering Ellingham diagram, which of the following metals can be used to reduce alumina?

- |       |       |
|-------|-------|
| a) Fe | b) Cu |
| c) Mg | d) Zn |

2. In Nickel tetracarbonyl, Iron pentacarbonyl and Chromium hexacarbonyl the oxidation state of transition metal is

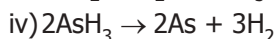
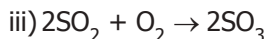
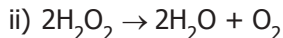
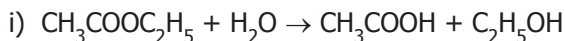
- |         |          |
|---------|----------|
| a) zero | b) one   |
| c) two  | d) three |

3. In which of the following,  $\text{NH}_3$  is not used?

- a) Nessler's reagent
- b) Reagent for the analysis of IV group basic radical

- c) Reagent for the analysis of III group basic radical  
d) Tollen's reagent
- 4. Identify the correct reason for lanthanide contraction.**  
a) decreasing nuclear charge  
b) decreasing screening effect  
c) increasing nuclear charge  
d) negligible screening effect
- 5. The type of isomerism found in the complexes  $[\text{Co}(\text{NO}_2)(\text{NH}_3)_5]\text{SO}_4$  and  $[\text{Co}(\text{SO}_4)(\text{NH}_3)_5]\text{NO}_2$**   
a) Hydrate isomerism                      b) Coordination isomerism  
c) Linkage isomerism                      d) Ionization
- 6. The solid in which its constituents have an orderly arrangement extending over a long range**  
a) Ionic solids                                  b) Molecular solids  
c) Crystalline                                  d) Hydrogen bonded solids
- 7. The addition of a catalyst during a chemical reaction alters which of the following quantities?**  
a) Enthalpy                                      b) Activation energy  
c) Entropy                                        d) Internal energy
- 8. Henderson equation for a weak acid and its salt is**  
a)  $\text{pH} = \text{pK}_b + \log (\text{Salt}) / (\text{Acid})$   
b)  $\text{pH} = \text{pK}_a + \log (\text{Salt}) / (\text{Acid})$   
c)  $\text{pH} = \text{pK}_a + \log (\text{Salt}) / (\text{Base})$   
d)  $\text{pH} = \text{pK}_a + \log (\text{Acid}) / (\text{Salt})$
- 9. A certain current liberated 0.504 gm of hydrogen in 2 hours. How many grams of copper can be liberated by the same current flowing for the same time in a copper sulphate solution**  
a) 31.75    b) 15.8  
c) 7.5    d) 63.5

**10. Which among the following reactions is an example of auto catalysis?**



a) only (i)

b) (i) and (ii)

c) (i) and (iii)

d) (i) and (iv)

**11. Ethylene glycol is dehydrated to diethylene glycol by**

a)  $\text{Conc. H}_3\text{PO}_4$

b)  $\text{Conc. H}_2\text{SO}_4$

c)  $\text{anhy. ZnCl}_2$

d) heat at 773K

**12. Which of the following compounds is oxidized to give ethyl methyl ketone?**

a) 2-propanol

b) 2-pentanone

c) 1-butanol

d) 2-butanol

**13. The basic character of amines is due to the**

a) tetrahedral structure

b) presence of nitrogen atom

c) lone pair of electron on nitrogen atom

d) high electronegativity of nitrogen

**14. If a person bleeds by his gingiva, so what would you suggest to eat to prevent the disease?**

a) vegetable oil

b) citrus fruits

c) cheese

d) milk

**15. What are the raw materials required for the manufacture of terylene?**

a) ethylene glycol + terephthalic acid

b) phthalic anhydride + phenol

c) adipic acid + hexamethylene diamine

d) phenol + methanol

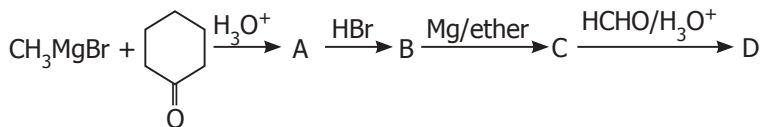
**Part - II****Answer any six questions. Question No. 24 is Compulsory.****6×2=12**

16. How will you prepare borax beads from borax?
17. Why HCl and  $\text{HNO}_3$  cannot be used for making the  $\text{KMnO}_4$  acidic medium?
18. Write the rate law for the following reactions.
  - a) A reaction that is  $3/2$  order in x and zero order in y.
  - b) A reaction that is second order in NO and first order in  $\text{Br}_2$ .
19. Why ionic product of water increases with increases in temperature?
20. What advantage do that fuel cells have over primary and secondary batteries?
21. How will you prepare pinacol from acetone?
22. Human cannot use cellulose as food. Why?
23. What are antacids? Give three example of antacids.
24. Show how the Cyclohexylmethanol prepared by the reaction of a suitable Grignard reagent on methanal.

**Part - III****Answer any six questions. Question No. 33 is compulsory.****6×3=18**

25. How will you extract the copper from copper pyrites?
26. Complete the following reactions.
  - i)  $2\text{XeOF}_4 + \text{SiO}_2 \rightarrow$
  - ii)  $\text{Cu} + 2\text{H}_2\text{SO}_4 \rightarrow$
  - iii)  $6\text{AgNO}_3 + \text{PH}_3 + 3\text{H}_2 \rightarrow$
27. Discuss briefly giving an example in each case the role of coordination compounds in Extraction/metallurgy of metals.

28. What are the various deemulsification techniques?
29. Identify A, B, C, D and write the complete equation.



30. What happens when the following alkenes are subjected to reductive ozonolysis
- propene?
  - isobutylene?
31. Write a short note on
- Schotten – Baumann reaction
  - Diazotisation
32. What is anaesthetics? Explain its types with example.
33. Indicate find out whether lead chloride gets precipitated or not when 1 mL of 0.1M lead nitrate and 0.5 mL of 0.2 M NaCl solution are mixed?  $K_{sp}$  of  $\text{PbCl}_2$  is  $1.2 \times 10^{-5}$

### Part - IV

**Answer all the following questions.**

**5×5=25**

34. a) i) Metallic sodium is extracted by the electrolysis of brine (aq.NaCl). After electrolysis the electrolytic solution becomes basic in nature. Write the possible electrode reaction.
- ii) Explain about types of Silicones and their preparation.

**(OR)**

- b) i)  $\text{N}_2\text{O}_5$  is more acidic than  $\text{N}_2\text{O}_3$ .
- ii) Discuss briefly the nature of bonding in metal carbonyls.

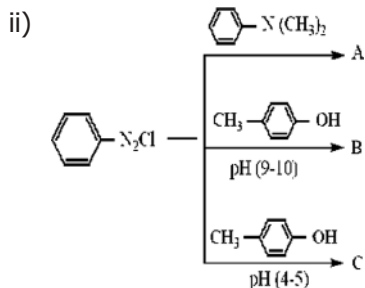
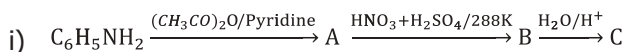
35. a) i) Explain about Hume-Rothery rule to form a substitute alloy.  
ii) Explain buffer action with example.

(OR)

- b) i) Write the name of the cell used in phones. Write the reaction taking place at the anode and the cathode of the cell.  
ii) Explain how colloids are purified by electrodialysis and ultrafiltration.
36. a) i) Starting from phenol how will you prepare the following:  
i) Aniline  
ii) Benzoquinone  
iii) Picric acid

(OR)

- b) Predict A, B, C and for the following reaction.



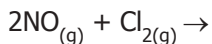
37. a) Describe the structure of DNA.

(OR)

- b) i) Explain about competitive inhibition with example or How growth of bacteria is prevented by competitive inhibition?

ii) Differentiate thermoplastic and thermosetting plastic.

38. a) Find the individual and overall order of the following reaction using the given data.



Experiment number	Initial concentration		Initial rate
	NO	Cl <sub>2</sub>	NOCl mol L <sup>-1</sup> s <sup>-1</sup>
1	0.1	0.1	$7.8 \times 10^{-5}$
2	0.2	0.1	$3.12 \times 10^{-4}$
3	0.2	0.3	$9.36 \times 10^{-4}$

**(OR)**

- b) An alkene (A) on ozonolysis gives propanone and aldehyde (B). When (B) is oxidised (C) is obtained. (C) is treated with Br<sub>2</sub>/P gives (D) which on hydrolysis gives (E). When propanone is treated with HCN followed by hydrolysis gives (F). Identify A, B, C, D, E & F.

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**MODEL QUESTION PAPER - 9****XII - STANDARD****Chemistry**

Time Allowed: 15 min + 2:30 hrs

Max. Marks: 70

Instructions:

1. Check the question paper for fairness of printing. If there is any lack of fairness, inform the Hall Supervisor immediately.
2. Use Blue (or) Black ink to write and underline use pencil to draw diagrams.

Note: Draw diagrams and write questions wherever necessary.

**PART – I****Note: 1. Answer all the questions.  $15 \times 1 = 15$** 

2. Choose the most appropriate answer from the given four alternatives and write the option code and the corresponding answer.

**1. Find the odd one out.**

- |               |                |
|---------------|----------------|
| a) Sphalerite | b) Galena      |
| c) Azurite    | d) Iron pyrite |

**2. Boric acid is an acid because its molecule**

- a) contains replaceable  $H^+$  ion
- b) gives up a proton
- c) combines with proton to form water molecule
- d) accepts  $OH^-$  from water, releasing proton

**3. The shape of ammonia molecule is**

- |                  |               |
|------------------|---------------|
| a) tetrahedral   | b) pyramidal  |
| c) square planar | d) octahedral |

4. **The lanthanide contraction is responsible for the fact that**
  - a) Zr and Zn have the same oxidation state
  - b) Zr and Hf have almost the same radius
  - c) Zr and Nb have similar oxidation state
  - d) Zr and Y have similar radius
5. **Phthalo blue –a bright blue pigment is a complex of**
  - a) Copper (I) ion
  - b) Copper (II) ion
  - c) Nickel (II) ion
  - d) Nickel (IV) ion
6. **The radius of an atom is 300 pm, if it crystallizes in a face centered cubic lattice, the length of the edge of the unit cell is**
  - a) 488.5 pm
  - b) 848.5 pm
  - c) 884.5 pm
  - d) 484.5 pm
7. **The unit of zero order rate constant is**
  - a) litre mol<sup>-1</sup> sec<sup>-1</sup>
  - b) mol litre<sup>-1</sup> sec<sup>-1</sup>
  - c) sec<sup>-1</sup>
  - d) litre<sup>2</sup> sec<sup>-1</sup>
8. **Degree of dissociation is nearly equal to 1 for**
  - a) Strong acids and strong bases
  - b) Strong acids and weak bases
  - c) Weak acids and strong bases
  - d) Weak acids and weak bases
9. **The cathode in Leclanche cell is**
  - a) Zinc container
  - b) spongy lead
  - c) graphite rod in contact with MnO<sub>2</sub>
  - d) HgO mixed with graphite

10. Colloidal solution of ink is prepared by
  - a) mechanical dispersion
  - b) electro dispersion
  - c) ultrasonic dispersion
  - d) peptisation
11. The ultimate product obtained when glycerol reacts with oxalic acid at 533 K is
  - a) formic acid
  - b) glycerol oxalate
  - c) allyl alcohol
  - d) acrolein
12. When chlorine is passed through acetic acid in presence of red phosphorous, it forms \_\_\_\_\_.
  - a) acetyl chloride
  - b) trichloro acetaldehyde
  - c) trichloro acetic acid
  - d) methyl chloride
13. Nitration of nitrobenzene results in
  - a) o-dinitro benzene
  - b) 1,3,5-trinitro benzene
  - c) p-dinitro benzene
  - d) m-dinitro benzene
14. The vitamin used in the building of collagen is
  - a) vitamin A
  - b) vitamin C
  - c) vitamin E
  - d) vitamin K
15. The monomer unit of natural rubber is
  - a) cis isoprene
  - b) trans isoprene
  - c) orlon
  - d) caprolactam

### Part - II

Answer any six questions. Question No. 24 is Compulsory.

6×2=12

16. What is the role of Limestone in the extraction of Iron from its oxide  $\text{Fe}_2\text{O}_3$ ?
17. What is the hybridisation of iodine in  $\text{IF}_7$ ? Give its structure.
18. Give one test to differentiate  $[\text{Co}(\text{NH}_3)_5\text{Cl}]\text{SO}_4$  and  $[\text{Co}(\text{NH}_3)_5\text{SO}_4]\text{Cl}$ .

19. Explain with suitable examples, how the molecularity of a reaction is different from order of reaction.
20. Which will be adsorbed more readily on the surface of charcoal and why  $\text{NH}_3$  or  $\text{CO}_2$ ?
21. Write a note on Phthalein reaction.
22. Name the four bases present in DNA. Which one of these not present in RNA?
23. If water contains dissolved calcium hydrogen carbonate, out of soaps and synthetic detergents which one will you use for cleaning clothes?
24. Identify compounds A, B, C in the following sequence of reactions.  

$$\text{CH}_3\text{NH}_2 \xrightarrow{\text{CH}_3\text{Br}} \text{A} \xrightarrow{\text{CH}_3\text{COCl}} \text{B} \xrightarrow{\text{B}_2\text{H}_6} \text{C}$$

### Part - III

**Answer any six questions. Question No. 33 is compulsory.**

**6×3=18**

25. How will you identify presence of borate test radical?
26. Which is stronger reducing agent  $\text{Cr}^{3+}$  or  $\text{Fe}^{2+}$ ?
27. Write a note on Metallic solids.
28. What are the characteristics of catalyst?
29. How will you prepare the following
  - i) ethene from ethylene glycol?
  - ii) dinitroglycol from ethylene glycol?
  - iii) 1,2-epoxyethane (oxirane) from ethylene glycol?
30. Write a short note on
  - i) Perkins' reaction.
  - ii) Knoevenagel reaction.
31. Derive Nernst equation.
32. Write a note on synthetic detergents.

33. Calculate the pH of an aqueous solution obtained by mixing 50 ml of 0.2 M HCl with 50 ml 0.1 M NaOH.

**Part - IV**

**Answer all the following questions.**

**5×5=25**

34. a) i) Give the Application of Aluminium.  
ii) Describe briefly allotropism in p-block elements with specific reference to carbon and boron.

**(OR)**

- b) i) Give two equations to illustrate the chemical behaviour of phosphine.  
ii) What are interstitial compounds? What are the properties of interstitial compounds.
35. a) i) How does  $\Delta_0$  (CFSE) decide actual configuration of d-orbitals in coordination entity?  
ii) Explain effect of adding catalyst on activation energy and why do we heat the solution of oxalic acid in redox titration against  $\text{KMnO}_4$ ?

**(OR)**

- b) i) Derive an expression for the hydrolysis constant and degree of hydrolysis of salt of strong base and weak acid.  
ii) Explain about Electrophoresis.
36. a) How will you prepare phenol from  
i) Aniline?  
ii) Chlorobenzene?  
iii) Cumene?

**(OR)**

- b) How will you prepare propan-1-amine from  
i) butane nitrile

- ii) propanamide
  - iii) 1-nitropropane
37. a) What happens when D-fructose is treated with the following reagents?
- i) HI
  - ii) Sodium amalgam
  - iii)  $\text{HNO}_3$

**(OR)**

- b) How are the following polymers prepared?
- i) Buna-N
  - ii) Buna-S
  - iii) PHBV
38. a) i) Ionic conductance at infinite dilution of  $\text{Al}^{3+}$  and  $\text{SO}_4^{2-}$  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.
- ii) The resistance of a conductivity cell is measured as 190  $\Omega$  using 0.1 M KCl solution (specific conductance of 0.1 M KCl is  $1.3 \text{ Sm}^{-1}$ ). When the same cell is filled with 0.003 M sodium chloride solution, the measured resistance is 6.3  $\text{k}\Omega$ . Both these measurements are made at a particular temperature. Calculate the specific and molar conductance of NaCl solution.

**(OR)**

- b) An organic compound A ( $\text{C}_7\text{H}_6\text{O}$ ) has bitter almond smell, with ammonia 'A' gives 'B' ( $\text{C}_{21}\text{H}_{18}\text{N}_2$ ) with aqueous alcoholic KCN 'A' gives 'C' ( $\text{C}_{14}\text{H}_{12}\text{O}_2$ ). With aromatic tertiary amine 'A' gives 'D' ( $\text{C}_{23}\text{H}_{26}\text{N}_2$ ). What are A, B, C and D explain the reaction.

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**MODEL QUESTION PAPER - 10**

**XII - STANDARD**

**Chemistry**

Time Allowed: 15 min + 2:30 hrs

Max. Marks: 70

Instructions:

1. Check the question paper for fairness of printing. If there is any lack of fairness, inform the Hall Supervisor immediately.
2. Use Blue (or) Black ink to write and underline use pencil to draw diagrams.

Note: Draw diagrams and write questions wherever necessary.

**PART – I**

**Note: 1. Answer all the questions.  $15 \times 1 = 15$**

**2. Choose the most appropriate answer from the given four alternatives and write the option code and the corresponding answer.**

**1. Which of the following is not true with respect to Ellingham diagram?**

- a) Free energy changes follow a straight line. Deviation occurs when there is a phase change.
- b) The graph for the formation of  $\text{CO}_2$  is a straight line almost parallel to free energy axis.
- c) Negative slope of CO shows that it becomes more stable with increase in temperature.
- d) Positive slope of metal oxides shows that their stabilities decrease with increase in temperature.

**2. Mc Afee process is for the preparation of**

- |                           |                            |
|---------------------------|----------------------------|
| a) $\text{BF}_3$          | b) $\text{AlCl}_3$         |
| c) $\text{B}_2\text{H}_6$ | d) $\text{H}_3\text{BO}_3$ |

**3. The first ionisation energy of noble gases is in the order**

- a)  $\text{He} < \text{Ne} < \text{Ar} < \text{Kr}$                       b)  $\text{He} > \text{Ne} > \text{Ar} > \text{Kr}$   
 c)  $\text{He} < \text{Ne} > \text{Ar} < \text{Kr}$                       d)  $\text{He} > \text{Ne} < \text{Ar} > \text{Kr}$

**4. Most of the transition metal ions are coloured, because of the**

- a) Presence of unpaired electrons.  
 b) Energy gap between two energy levels is very small.  
 c) Both (a) and (b)  
 d) Neither (a) nor (b)

**5. The geometry and hybridization of  $[\text{Fe}(\text{CO})_5]$**

- a) Trigonal planar,  $\text{dsp}^3$                       b) Octahedral,  $\text{dsp}^2$   
 c) Trigonal Bipyramidal,  $\text{dsp}^3$                       d) Octahedral,  $\text{sp}^3\text{d}^2$

**6. In AAA type each sphere is arranged in contact with ---- of its neighbours.**

- a) six    b) four  
 c) two    d) none of these

**7. Assertion : rate of reaction doubles when the concentration of the reactant is doubles if it is a first order reaction.**

**Reason : rate constant also doubles.**

- a) Both assertion and reason are true and reason is the correct explanation of assertion.  
 b) Both assertion and reason are true but reason is not the correct explanation of assertion.  
 c) Assertion is true but reason is false.  
 d) Both assertion and reason are false.

**8. With regard to the strength of acids and bases, find the incorrect statement among the following.**

- a) strong acids is one that completely dissociates in water.  
 b)  $K_a$  is the dissociation constant.

- c)  $\text{CH}_3\text{COOH}$  is a weak acid.  
d) smaller the  $K_a$  value, greater is the acid strength.

**9. Among the following cells**

- I) Leclanche cell                      II) Nickel – Cadmium cell  
III) Lead storage battery            IV) Mercury cell

**Primary cells are**

- a) (I) and (IV)                      b) (I) and (III)  
c) (III) and (IV)                  d) (II) and (III)

**10. The iron catalyst used in the synthesis of ammonia in Haber's process is poisoned by**

- a)  $\text{As}_2\text{O}_3$                               b)  $\text{V}_2\text{O}_5$   
c)  $\text{H}_2\text{S}$                                  d) Glycerine

**11. Which one of the following has the highest boiling point?**

- a)  $\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2\text{CH}_3$             b)  $\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2\text{OH}$   
c)  $\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_3$                 d)  $\text{CH}_3\text{CH}_2\text{CH}_2\text{Cl}$

**12. Pick out the compound that reduces Tollen's reagent and Fehling's solution.**

- a)  $\text{CH}_3\text{CHO}$                               b)  $\text{CH}_3\text{COCH}_3$   
c)  $\text{CH}_3\text{COOH}$                           d) both (a) and (b)

**13.  $\text{C}_6\text{H}_5\text{NH}_2$  is treated with  $\text{NaNO}_2 / \text{HCl}$  it forms X. Identify X.**

- a)  $\text{C}_6\text{H}_5\text{Cl}$                               b)  $\text{C}_6\text{H}_5\text{NHOH}$   
c)  $\text{C}_6\text{H}_5\text{N}_2\text{Cl}$                         d)  $\text{C}_6\text{H}_5\text{OH}$

**14. Inversion of sucrose refers to**

- a) oxidation of sucrose  
b) reduction of sucrose  
c) hydrolysis of sucrose to glucose and fructose  
d) polymerization of sucrose

**15. Which of the following is called PABA?**

- a) p – nitro benzanilic acid
- b) p – amino butyric acid
- c) p – amino benzene sulphonic acid
- d) p – amido benzene sulphonyl chloride

**Part - II**

**Answer any six questions. Question No. 24 is Compulsory.**

**6×2=12**

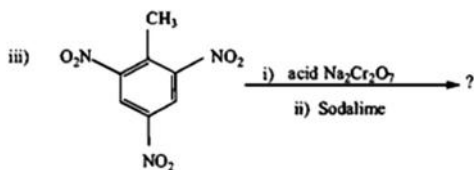
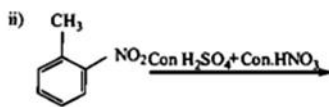
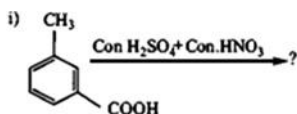
16. Write a short note on hydroboration.
17. Calculate the equivalent weight of  $\text{KMnO}_4$  in acidic medium.
18. Sketch:
  - i) FCC
  - ii) BCC
19. A reaction is of second order in A and first order in B.
  - i) Write the differential rate equation.
  - ii) How is the rate affected when the concentration of both A and B is doubled?
20. What are the factors affecting electrolytic conductance?
21. Define active centres.
22. Give simple chemical tests to distinguish between the following pairs of compounds.
  - i) Benzoic acid and Ethyl benzoate.
  - ii) Ethanal and Propanal.
23. What are epimers?
24. How will you convert diethylamine into
  - i) N, N – diethylacetamide?
  - ii) N – nitrosodiethylamine?

Part - III

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

6×3=18

25. Explain about aluminothermic process.
26. Write down tests for sulphate/sulphuric acid.
27. Explain Ionisation & Hydration isomerism with example.
28. When the dilution increases by 100 times, the dissociation increases by 10 times. Justify this statement.
29. Identify the products in the following reaction. Write the IUPAC name and mention the mechanism involved in the reaction.
  - i) neopentylalcohol  $\xrightarrow{\text{PCl}_5}$
  - ii) butan-1-ol + NaBr  $\xrightarrow{\text{H}_2\text{SO}_4}$
30. Predict the major product that would be obtained on nitration of the following compounds.



31. Write a short note on a different types of RNA which are found in cell.
32. Explain about Schottky and Frenkel defect.
33. Calculate the emf of the following cell at 25°C using Nernst equation.  $\text{Cu (s)} \mid \text{Cu}^{2+} (0.25 \text{ aq, M}) \parallel \text{Fe}^{3+} (0.05 \text{ aqM}) \mid \text{Fe}^{2+} (0.1 \text{ aq M}) \mid \text{Pt (s)}$

Given :  $E_0 \text{Fe}^{3+} \mid \text{Fe}^{2+} = 0.77 \text{V}$   $E_0 \text{Cu} \mid \text{Cu}^{2+} = 0.34 \text{V}$

### Part - IV

**Answer all the following questions.**

**5×5=25**

34. a) i) Write the equation for the extraction of silver by leaching with sodium cyanide and show that the leaching process is redox reaction.

ii) Explain about structure and uses of boric acid.

**(OR)**

a) i) How will you manufacture the chlorine by Deacon's process?

ii) How does the neutral alkaline potassium permanganate solution react with (a) Nitrites (b) oxalic acid (c) ferrous salts? Write the ionic equations for the reactions.

35. a) i) Explain the Classification of metallic carbonyls based on structure.

ii) Determine packing efficiency in simple cubic unit cell.

**(OR)**

b) i) What is solubility product? How it is used to decide the precipitation of ions.

ii) Differentiate physisorption and chemisorption.

36. a) How will you bring about the following conversions in not more than two steps?

i) Benzaldehyde to  $\alpha$ -Hydroxyphenylacetic acid

ii) Bromobenzene to 1-Phenylethanol

iii) Propanone to Propene

**(OR)**

b) How will you prepare nitromethane from

i) Methyl bromide?

ii)  $\alpha$  - halocarboxylic acid?

iii) Methane?

37. a) Write about classification of carbohydrates.

**(OR)**

- b) i) Differentiate between addition and condensation polymers based on the mode of polymerisation. Give one example of each type.
- ii) Write a note on preservatives.
38. a) i) For a first order reaction the rate constant at 500K is  $8 \times 10^4 \text{ s}^{-1}$ . Calculate the frequency factor, if the energy of activation for the reaction is  $190 \text{ kJ mol}^{-1}$ .
- ii) The time for half change in a first order decomposition of a substance A is 60 seconds. Calculate the rate constant. How much of A will be left after 180 seconds?

**(OR)**

- b) An organic compound (A) of molecular formula  $\text{C}_6\text{H}_6\text{O}$  on reaction with benzene diazonium chloride gives (B) dye. (A) on reaction with  $\text{K}_2\text{Cr}_2\text{O}_7$  gives (C) of molecular formula  $\text{C}_6\text{H}_4\text{O}_2$ . (C) on reaction with  $\text{H}_2$  in presence of nickel gives (D). Identify A, B, C, D.

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## Key Answers for Objective Questions

### Govt. Model Question Paper

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

### Model Question Paper - 1

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

### Model Question Paper - 2

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

### Model Question Paper - 3

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

### Model Question Paper - 4

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

### Model Question Paper - 5

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

**Model Question Paper - 6**

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

**Model Question Paper - 7**

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

**Model Question Paper - 8**

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

**Model Question Paper - 9**

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

**Model Question Paper - 10**

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

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