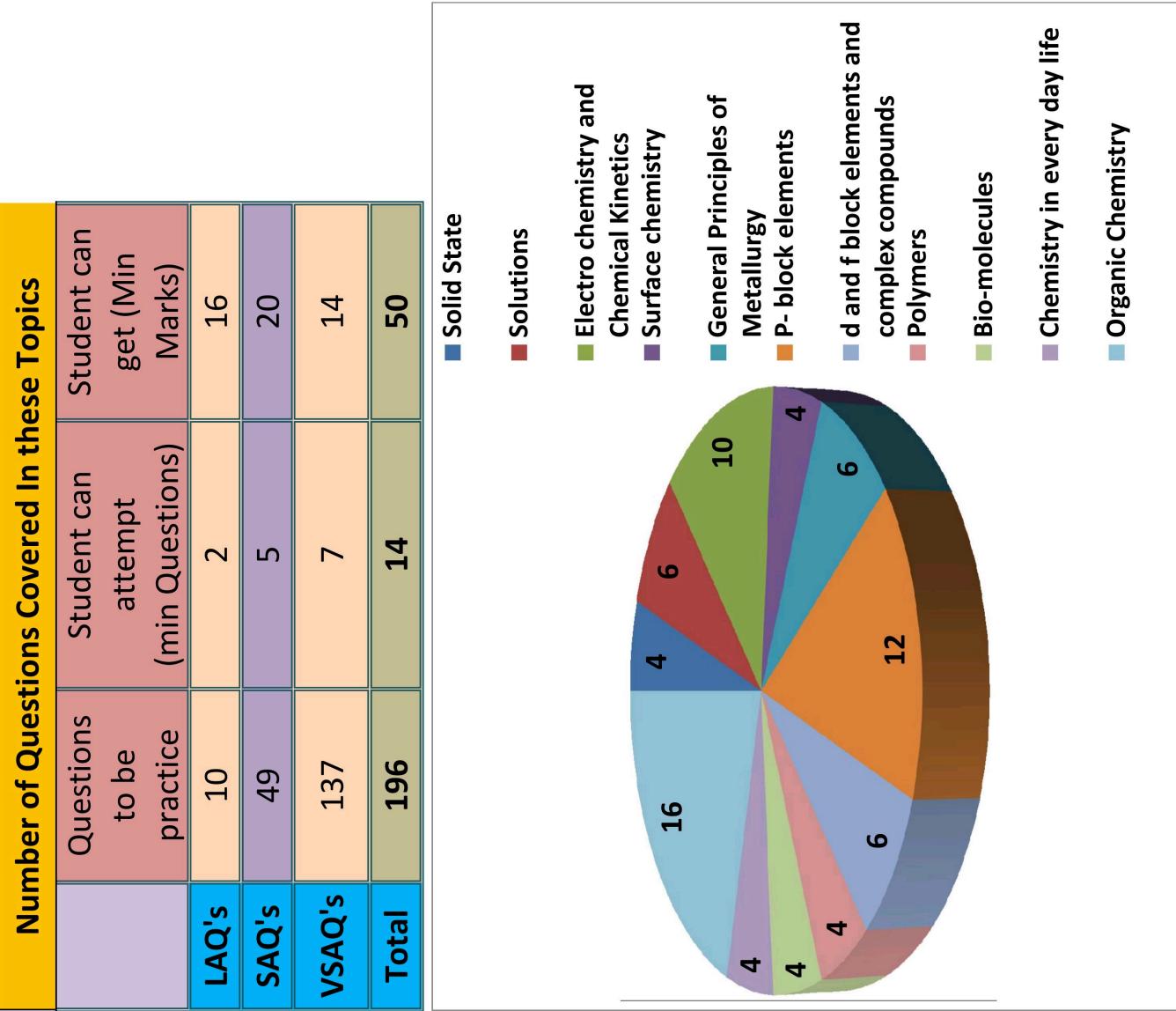


CHEMISTRY TOPIC WISE WEIGHTAGE

How to Score Minimum 40-50 Marks For Slow Learners

S.N O	CHAPTER NAME	NO OF QUESTIONS			WEIGHTAGE GE
		LAQ's	SAQ's	VSAQ's	
1	Solid State	-	3	9	4
2	Solutions	-	1	13	6
3	Electro chemistry and Chemical Kinetics	3	8	15	10
4	Surface chemistry	-	5	11	4
5	General Principles of Metallurgy	-	6	6	6
6	P- block elements	5	6	22	12
7	d and f block elements and complex compounds	-	6	11	6
8	Polymers	-	2	16	4
9	Bio-molecules	-	6	7	4
10	Chemistry in every day life	-	1	13	4
11	Organic Chemistry	2	5	14	16
	TOTAL	10	49	137	76

Number of Questions Covered In these Topics



■ Chemistry in every day life

■ Organic Chemistry

■ Bio-molecules

■ Solid State

■ Solutions

■ Surface chemistry

■ General Principles of Metallurgy

■ P-block elements

■ Electro chemistry and Chemical Kinetics

SR.INTER - CHEMISTRY_IMP_QUESTIONS
LAQ'S (8 MARKS QUESTIONS)
ELECTRO CHEMISTRY

1***. What are galvanic cells ? Explain the working of a galvanic cell with a neat sketch taking Daniel cell as example.

2***. What is electrolysis? Give Faraday first law, Faraday second law?

CHEMICAL KINETICS

3***. Give the detailed account of the collision theory of reaction rates of bimolecular gaseous reaction.

NUMERICAL DATA BASED AND CONCEPT ORIENTED QUESTIONS

*. A reaction has a half-life of 10 minutes. Calculate the rate constant for the first order reaction.

P - BLOCK ELEMENTS

GROUP 15 ELEMENTS

4***. How is ammonia manufactured by Haber's process? Explain the reactions of ammonia with

- a) $\text{ZnSO}_4\text{(aq)}$ b) $\text{CuSO}_4\text{(aq)}$ c) $\text{AgCl}_{(s)}$

5**. How is nitric acid manufactured by Ostwald's process? How does it react with the following?

- a) Copper b) Zn c) S_8 d) P_4

GROUP 16 ELEMENTS

6****. How is ozone prepared from oxygen? Explain its reaction with

- a) PbS b) KI c) Hg d) Ag e) C_2H_4 f) C_2H_2

GROUP 17 ELEMENTS

7***. How is chlorine prepared in the laboratory? How does it react with the following?

- a) Iron c) acidified FeSO_4 d) Iodine e) H_2S f) $\text{Na}_2\text{S}_2\text{O}_3$

8***. How is chlorine prepared by electrolytic method?

Explain its reaction with a) NaOH b) NH_3 under different conditions.

Alcohols, Phenols, Ethers

9***. With a suitable example write equations for the following.

- **i) Kolbe's reaction **ii) Reimer – Tiemann reaction ***iii) Williamson's ether synthesis

ALDEHYDES, KETONES AND CARBOXYLIC ACIDS

10***. Describe the following

- i) Acetylation ii) Cannizaro reaction
iii) Cross aldol condensation iv) Decarboxylation

SAQ'S (4 MARKS QUESTIONS)

SOLID STATE

1. Explain similarities and differences between metallic and ionic crystals.
- 2*. Derive Bragg's equation.
- 3.* Describe the two main types of semi-conductors and contrast their conduction mechanism?

SOLUTIONS

- 4*. what is relative lowing of vapour pressure? How it is useful to determine the molar mass of a solute?

ELECTRO CHEMISTRY

- 5*. What is metallic corrosion ? Explain it with respect to Iron corrosion
- 6***.State and explain Kohlrausch's law of independent migration of ions along with applications?
7. What are primary and secondary batteries? Give one example for each.
8. Give the construction and working of SHE with neat diagram?

CHEMICAL KINETICS

- 9**. What is half-life ($t_{1/2}$) of a reaction? Derive the equations for the 'half-life' value of zero and first order reactions.
- 10*. What is the molecularity of reaction? How it is different from the order of reaction? Name one bi-molecular and Tri-molecular gaseous reaction?
- 11*. Derive Integrated rate equation of zero order nd 1st order reaction?
- 12**. Discuss the effect of catalyst and Temp on the kinetics of chemical rxn with diagram?

SURFACE CHEMISTRY

- 13***.What is catalysis ? How is catalysis classified? Give two examples for each type of catalysis.
- 14***. What are different types of adsorption? Give any 4 difference between characteristics of these different types.
- 15**. What are emulsions. How are they classified. Describe the applications of emulsions?
- 16***. What are micelles? Discuss the mechanism of micelle formation and cleaning action of soap?
- 17***. How are colloids classified on the basis of interaction between dispersed phase and dispersed medium?

GENERAL PRINCIPLES OF METALLURGY

- 18***. Giving examples to differentiate roasting and calcination.
- 19*. Outline the principles of refining of metals by the following methods.
**a) Zone refining *b) Electrolytic refining **c) Poling d) Vapour phase refining
- 20***. Expalin the purification of sulphide ore by froth floatation method.
- 21*. How is copper extracted from copper pyrites?
- 22**. Explain briefly the extraction of aluminium from bauxite
- 23*. Explain the extraction of zinc from zincblende?

P - BLOCK ELEMENTS

GROUP 15 ELEMENTS

- 24***.How does PCl_5 react with the following?
a) Water b) $\text{C}_2\text{H}_5\text{OH}$ c) CH_3COOH d) Ag

GROUP 16 ELEMENTS

25**. Describe the manufacture of H_2SO_4 by contact process.

GROUP 17 ELEMENTS

26**. What are interhalogen compounds? Give some example to illustrate the definition. How are they classified?

d AND f BLOCK ELEMENTS & COORDINATION COMPOUNDS

27. What are interstitial compounds? How are they formed? Give two examples.

28***. Explain Werner's theory of coordinate compounds with suitable examples.

29.*. Explain the terms i) Ligand

ii) Coordination number iii) Coordination entity iv) Central metal atom/ion

30**. Give the oxidation numbers of the central metal atoms in the following complex entities

i) $[\text{Ni}(\text{CO})_4]$ ii) $[\text{Co}(\text{NH}_3)_6]^{3+}$ iii) $[\text{Fe}(\text{CN})_6]^{4-}$ and iv) $[\text{Fe}(\text{C}_2\text{O}_4)_3]^{3-}$

31**. Using IUPAC norms write the systematic names of the following:

i) $[\text{Co}(\text{NH}_3)_6]\text{Cl}_3$ ii) $[\text{Pt}(\text{NH}_3)_2\text{Cl}(\text{NH}_2\text{CH}_3)]\text{C}$ liii) $[\text{Ti}(\text{H}_2\text{O})_6]^{3+}$ and iv) $[\text{NiCl}_4]^{2-}$

32. Explain geometrical isomerism in coordination compounds giving suitable examples.

GROUP 18 ELEMENTS

33**. How are xenon fluorides XeF_2 , XeF_4 and XeF_6 obtained ?

34**. How are XeO_3 , XeO_2F_2 and XeOF_4 prepared ? along molecular shape

35*. Explain the reaction of the following with water

a) XeF_2 b) XeF_4 c) XeF_6

POLYMERS

36***. Classify the following into addition and condensation polymers.

i) Terylene ii) bakelite iii) Poly Vinyl chloride iv) Polythene

37***. Write the names and structures of the monomers of the following polymers

*i) Buna -S **ii) Buna -N iii) Dacron iv) Neoprene

BIOMOLECULES

38*. Write a brief note on the structure of glucose

39*. What are hormones? Give one example for each.

i) steroid hormones
ii) Poly peptide hormones
iii) amino acid derivatives.

40***. Give the sources of the following vitamins and name the diseases caused by their deficiency

a) A b) D c) E and d) K

41**. What are the essential and non-essential amino acids? Give one example for each.

42. Write the importance of carbohydrates

43*. Define the following as related to proteins.

i) Peptide linkage ii) Primary structure iii) Denaturation

CHEMISTRY IN EVERYDAY LIFE

44***. What are analgesics ? How are they classified ? Give examples

HALOALKANES AND HALOARENES

45***. Explain the mechanism of SN^1 and SN^2 reaction with one example.

46**. Define the following:

- i) Racemic mixture ii) Retention of configuration iii) Enantiomers.

Alcohols, Phenols, Ethers

47***. Explain the acidic nature of phenols and compare with that of alcohols.

ORGANIC COMPOUNDS CONTAINING NITROGEN

48. Write the mechanism of Hoffmann bromamide reaction.

49***. Explain the following name reactions?

- i) Sandmeyer reaction ii) Getterman reaction

VSAQ'S (2 MARKS QUESTIONS)

SOLID STATE

- 1.* What is the coordination number of atoms in a cubic close-pack structure?
- 2.* What is the coordination number of atoms in a body-centred cubic structure?
3. How do you distinguish between crystal lattice and unit cell?
- 4*. How many lattice points are there in one unit cell of face-centered cubic lattice
- 5*. What is Schottky defect?
- 6*. What is Frenkel defect?
- 7*. What are f– centers?
8. How many lattice points are there in one unit cell of body centered cubic lattice
9. What are octahedral and tetrahedral voids?

SOLUTIONS

- 10*. Define molarity.
- 11*. Define molality.
- 12*. Define mole fraction.
- 13***. State Raoult's law.
- 14**. State Henry's law.
15. What is Ebullioscopic constant?
16. What is Cryoscopic constant?
- 17**. Define osmotic pressure.
- 18***. What are isotonic solutions?
- 19***. What is Van't Hoff's factor (i) and how is it related to ' α ' in the case of a binary electrolyte. (1:1)
- 20.***. Calculate the molefraction of H_2SO_4 in a solution containing 98% H_2SO_4 by mass.
21. What is an ideal solution ?
- 22*. A solution of glucose in water is labelled as 10% w/w. What would be the molarity of the solution?

ELECTRO CHEMISTRY

23. Write the cell reaction taking place in the cell
 $\text{Cu(s) / Cu}^{2+}\text{(aq) // Ag}^+\text{(aq) / Ag(s)}$
- 24***. What is Nernst equation ? Write the equation for an electrode with electrode reaction
 $\text{M}^{n+}\text{(aq)} + \text{ne}^- \rightleftharpoons \text{M(s)}$.
- 25.* How is Gibbs energy (G) related to the cell emf (E) mathematically?
- 26*. Define molar conductivity Λ_m and how is it related to conductivity (k)?
- 27**. Find the amount of Cu deposited at electrode by passing 2 amp electricity in 10 min from CuSO_4 solution?

CHEMICAL KINETICS

- 28*. Define the speed or rate of a reaction.
- 29**. Define Order of a reaction. Illustrate your answer with an example.
- 30**. Give the units of rate constants for Zero, first order and second order reactions
- 31***. Define molecularity of a reaction. illustrate your answer with an example.
- 32*. Give two examples for zero Order reactions.
33. Give two examples for gaseous first order reactions
- 34***. What is half-life of a reaction? Illustrate your answer with an example.
- 35***. What are pseudo first order reactions? Give one example.
- 36**. What is the effect of temperature on the rate constant?
- 37*. What is rate law? Illustrate with an example?

SURFACE CHEMISTRY

- 38**. Define "Promoters" and "poisons" in the phenomenon of catalysis.
- 39***. Name the dispersed phase and dispersion medium in the following colloidal systems
(i) fog (ii) smoke (iii) milk
- 40***. What is Tyndall effect?
- 41***. What is Brownian movement ?
- 42*. What is electrokinetic potential or zeta potential?
- 43*. What is electrophoresis?
- 44***. What is coagulation?
- 45*. State Hardy–Schulze rule
- 46***. What is an emulsion? Give two examples.
- 47***. What is an emulsifying agent?
48. Define Gold Number?

GENERAL PRINCIPLES OF METALLURGY

- 49*. What is the role of cryolite in the metallurgy of aluminium?
- 50***. Give the composition of the following alloys
a) Brass b) Bronze c) German silver
- 51*. Explain the terms gangue and slag
- 52*. What is matte ? Give its composition.

53**. What is blister copper? Why is it so called?

54. What is flux? Give an example.

P - BLOCK ELEMENTS

GROUP 15 ELEMENTS

55***. What is allotropy? Explain the different allotropic forms of phosphorus.

56***. What is inert pair effect?

57*. PH₃ is a weaker base than NH₃ - Explain.

58**. NH₃ forms hydrogen bonds but PH₃ does not - Why?

59**. Ammonia is good complexing agent. Explain with an example

60**. Iron becomes passive in Con. HNO₃. Why?

61. Give an example of

- a) Acidic oxide of phosphorus
- b) Neutral oxide of Nitrogen

GROUP 16 ELEMENTS

62***. Why is H₂O a liquid while H₂S is a gas?

63***. What is tailing of mercury? How is it removed?

64. Why are Gp 16 elements called chalcogens

65*. SO₂ can be used as an antichlor. Explain.

66*. Explain the structure of SF₄ and SF₆

GROUP 17 ELEMENTS

67**. Write the reactions of F₂ and Cl₂ with water.

68***. Electron gain enthalpy of fluorine is less than that of chlorine -explain.

69*. Bond dissociation enthalpy of F₂ is less than that of Cl₂-explain.

70***. What happens when Cl₂ reacts with dry slaked lime?

71**. What is aqua regia ? Write its equation with gold and platinum

72*. How is chlorine manufactured by Deacon's method?

73**. HF is liquid while HCl is gas. Explain?.

GROUP 18 ELEMENTS

74***. List out the uses of neon

75***. Write any two uses of argon

76**. In Modern diving apparatus, a mixture of He and O₂ is used-Why?

d AND f BLOCK ELEMENTS & COORDINATION COMPOUNDS

77*. What are transition elements? Give example

78**. Write the electronic configuration of chromium (Cr) and copper (Cu).

79***. Why Zn²⁺ is diamagnetic whereas Mn²⁺ is paramagnetic?

80***. Calculate the ‘spin only’ magnetic moment of $\text{Fe}^{2+}_{(\text{aq})}$ ion.

81**. What is an alloy? Give example.

82*. What is mischmetall? Give its composition and uses.

83*. What is a ligand?

84***. How many moles of AgCl is precipitated when 1 mole of CoCl_3 is treated with AgNO_3 solution?

85***. What is an chelate ligand? Give example.

86***. What is an ambidentate ligand? Give example.

87**. $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$ is blue in colour where as anhydrous CuSO_4 is colourless. Why?

POLYMERS

88**. Define the terms monomer and polymer.

89*. What is Polymerization? Give an example of polymerization reaction.

90**. Give one example each for synthetic and semi-synthetic polymers.

91**. What is addition polymer? Give example.

92***. What is condensation polymer? Give example.

93*. What are copolymers? Give example.

94***. What are Elastomers? Give example.

95***. What are thermoplastic polymers? Give example.

96***. What are thermosetting polymers? Give example.

97***. What is Ziegler–Natta catalyst?

98***. What is the difference between Buna–N and Buna–S?

99**. What is PDI (Poly Dispersity Index)?

100*. What is Vulcanisation of rubber?

101***. What is bio-degradable polymer? Give one example of a bio-degradable polyester?

102***. What is PHBV? How is it useful to man?

103***. Give the structure of Nylon–2–Nylon–6?

BIOMOLECULES

104***. Why are sugars classified as reducing & non reducing sugars?

105**. What are amino acids? Give two examples.

106*. What are reducing sugars?

107*. Differentiate between globular and fibrous proteins?

108*. What is zwitter ion? Give one example

109*. What are non-reducing sugars

110. Write two Methods of preparation of Glucose?

CHEMISTRY IN EVERYDAY LIFE

111***. What are antacids? Give example.

112**. What are antihistamines? Give example.

- 113***. What are tranquilizers? Give example.
- 114*. What are barbiturates?
- 115***. What are antimicrobials?
- 116***. What are antibiotics? Give example.
- 117***. What are antiseptics? Give example.
118. What are disinfectants? Give example.
- 119*. What is tincture of iodine? What is its use?
- 120***. What are food preservatives ? Give example
121. What is saponification?
- 122***. What is the difference between a soap and a synthetic detergent?
- 123**. What are artificial sweetening agents? Give examples?

HALOALKANES AND HALOARENES

- 124**. What is the stereochemical result of S_N^1 and S_N^2 reactions
- 125*. Explain the Grignard reagents preparation with suitable example.
- 126***. How will you carry out the following conversions?
i) Ethane to bromomethene ii) Toluene to benzyl alcohol
- 127*. What is wurtz Rxn
- 128*. What is Wurtz fitting Rxn
129. What is fitting Rxn

Alcohols, Phenols, Ethers

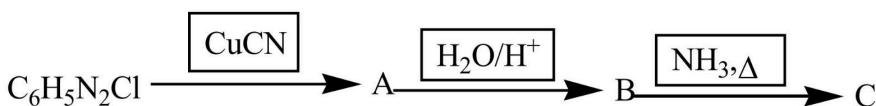
130. Give the reagents used for the preparation of phenol from chlorobenzene

ALDEHYDES, KETONES AND CARBOXYLIC ACIDS

- 131***. Write the reaction showing α – halogenation of carboxylic acid and give its name (H.V.Z reaction)
- 132***. Compare the acidic strength of acetic, chloroacetic acid, benzoic acid and phenol.

ORGANIC COMPOUNDS CONTAINING NITROGEN

- 133***. Gabriel phthalimide synthesis exclusively forms primary amines only. Explain
- 134*. Arrange the following bases in increasing order of their basic strength. Aniline, p–nitroaniline and p–toluidine
- 135***. Write equation for Carbylamine reaction of any one aliphatic amine.
- 136**. Give structures of A, B and C in the following reaction.



- 137**. Compare the basic strength of the following compounds.