

Dedication!

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ACTC **ADVANCED CHEMISTRY TUITION CENTRE, 41/1-PWD ROAD, NAGERCOIL-9940847892**

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PUBLIC EXAM +1 CHEMISTRY EXAM STUDY PLAN 2022 (8 DAYS PLAN)**IMPORTANT QUESTIONS BANK-2022, PREVIOUS YEAR QUESTION PAPER ANALYSIS****(Computer students)****May be**

- 5- 10% GOVT PUBLIC EXAM PREVIOUS YEAR QUESTION PAPER - MARCH 2019(M19), JULY 2019 (J19), SEP2020(S20).
- 5-10% first revision question paper APRIL 2022.
- 2-3%GOVT MODEL QUESTION PAPER 2018-19(GM).
- 30-50% Prepare well BOOK BACK- ONEWORD, QUESTION ANSWER
- 40-50%creative questions Text book inside
- Prepare well BOOK BACK, & Question answer, GOVT MODEL Question paper, Revision exams I, PUBLIC QUESTIONS.

QUESTION PATTERN-2022

Inorganic	UNIT 1,2,3,4,5	Physical	Unit 6, 7,8,9,10	Organic	Unit 11, 12, 13, 14
Part I	Choose 5x1=5	Part I	Choose 5x1=5	Part I	Choose 5x1=5
Part II	3x2=6		3x2=6		3x2=6
Part III	3x3=9		3x3=9		3x3=9
Part IV	3x5=15		3x5=15		4x5=20
	35		35		40

+1 STUDY PLAN 2022**DAY 1 PHYSICAL CHEMISTRY 12-05-2022 THURSDAY**

SN	TIME	LESSON	REMARKS
1	3-5PM	LESSON 6 BOOK READ 1 MARK ALL BB& INSIDE	
2	5-6 PM	Book Back Evaluation Question Answer	
	6-7 PM	BREAK	
3	7-9 PM	2 mark, 3 mark,5mark ACTC question Bank	
4	9-10 PM	Problem	

DAY 2 PHYSICAL CHEMISTRY 13-05-2022 FRIDAY

SN	TIME	LESSON	REMARKS
1	5-7 AM	LESSON 7 BOOK READ 1 MARK ALL BB& INSIDE	
2	7-8 AM	Book Back Evaluation Question Answer	
	8-9 AM	BREAK	
3	9-11 AM	2 mark, 3 mark,5mark ACTC question Bank	
4	11-1 PM	Problem	

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	1-2 PM	BREAK	
5	2- 4PM	LESSON 8 BOOK READ, 1 MARK ALL BB& INSIDE	
6	4-5 PM	Book Back Evaluation Question Answer	
7	5-7 PM	2 mark, 3 mark, 5mark ACTC question Bank	
8	7- 9 PM	Problem	
9	9-10 PM	REVISE LESSON 6, 7, 8 & TEST	

DAY 3 PHYSICAL CHEMISTRY 14-05-2022 SATURDAY

SN	TIME	LESSON	REMARKS
1	5-7 AM	LESSON 9 BOOK READ, 1 MARK ALL BB& INSIDE	
2	7-8 AM	Book Back Evaluation Question Answer	
	8-9 AM	BREAK	
3	9-11 AM	2 mark, 3 mark, 5mark ACTC question Bank	
4	11-1 PM	Problem	
	1-2 PM	BREAK	
5	2- 4PM	LESSON 10 BOOK READ, 1 MARK ALL BB& INSIDE	
6	4-5 PM	Book Back Evaluation Question Answer	
7	5-7 PM	2 mark, 3 mark, 5mark ACTC question Bank	
8	7- 8 PM	Problem	
9	8-10 PM	REVISE LESSON 6, 7, 8, 9, 10 & TEST	

DAY 4 INORGANIC CHEMISTRY 15-05-2022 SUNDAY

SN	TIME	LESSON	REMARKS
1	5-7 AM	LESSON 1 BOOK READ, 1 MARK ALL BB& INSIDE	
2	7-8 AM	Book Back Evaluation Question Answer	
3	8-10 AM	2 mark, 3 mark, 5mark ACTC question Bank	
4	10-11 AM	Problem	
5	11- 12PM	LESSON 2 BOOK READ, 1 MARK ALL BB& INSIDE	
6	12-1 PM	Book Back Evaluation Question Answer	
	1-2 PM	BREAK	
7	2-4 PM	2 mark, 3 mark, 5mark ACTC question Bank	
8	4- 5 PM	problem	
9	5-6 PM	LESSON 3 BOOK READ, 1 MARK ALL BB& INSIDE	
10	6-7 PM	Book Back Evaluation Question Answer	
11	7-9 PM	2 mark, 3 mark, 5mark ACTC question Bank	
12	9-10 PM	EQUATION & PTA QA	

DAY 5 INORGANIC CHEMISTRY 16-05-2022 MONDAY

SN	TIME	LESSON	REMARKS
1	5-7 AM	LESSON 4 BOOK READ, 1 MARK ALL BB& INSIDE	
2	7-8 AM	Book Back Evaluation Question Answer	

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	8-9 AM	BREAK	
3	9-11 AM	2 mark, 3 mark, 5 mark ACTC question Bank	
4	11-1 PM	EQUATION	
	1-2 PM	BREAK	
5	2- 4PM	LESSON 5 BOOK READ, 1 MARK ALL BB& INSIDE	
6	4-5 PM	Book Back Evaluation Question Answer	
7	5-7 PM	2 mark, 3 mark, 5 mark ACTC question Bank	
8	7- 8 PM	Equation	
9	8-10 PM	REVISE LESSON 1,2,3,4,5 & TEST	

DAY 6 ORGANIC CHEMISTRY 17-05-2020**TUESDAY**

SN	TIME	LESSON	REMARKS
1	5-7 AM	LESSON 11 BOOK READ, 1 mark BB	
2	7-8 AM	2 mark, 3 mark, 5 mark & ACTC question Bank	
3	8-9 AM	LESSON 12 BOOK READ, 1 mark BB	
4	9-11 AM	2 mark, 3 mark, 5 mark & ACTC question Bank	
5	11-1 PM	LESSON 13 BOOK READ, 1 mark BB	
6	1-3 PM	2 mark, 3 mark, 5 mark & ACTC question Bank	
7	3- 4PM	LESSON 14 BOOK READ, 1 mark BB	
8	4-5 PM	2 mark, 3 mark, 5 mark & ACTC question Bank	
9	5-7 PM	ORGANIC WORK SHEET & ACTC Work sheet	
10	7- 8 PM	ORGANIC PROBLEM & ACTC question Bank	
11	8-10 PM	ORGANIC ADDITIONAL ONE MARK ACTC 1 question	

DAY 7 REVISION**18-05-2022****WEDNESDAY**

SN	TIME	LESSON	REMARKS
1	5-7 AM	INORGANIC BOOK BACK ONE MARK TEST	
2	7-9 AM	PHYSICAL BOOK BACK ONE MARK TEST	
3	9-11 AM	ORGANIC BOOK BACK ONE MARK TEST	
4	11-12PM	ORGANIC NAME REACTION	
5	12- 1PM	PROBLEM LESSON 1,2,3	
6	1-3 PM	EQUATION REACTION LESSON 4 & 5	
7	3-4 PM	FIRST REVISION QUESTION PAPER APRIL 2022	
8	4-5 PM	GOVT MODEL 2019 previous year public QUESTION PAPERS MARCH 2019(M19), JULY 2019 (J19), SEP2020(S20)	
9	5-6 PM	LESSON 6-9 PROBLEM REVISION	
10	6-8PM	LESSON 11-14 PROBLEM REVISION, MECHANISM	
11	8-10PM	ONE MARK BOOK BACK REVISION & TEST	

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DAY 8 REVISION

19-05-2022

THURSDAY

SN	TIME	LESSON	REMARKS
1	4-5 AM	INORGANIC REVISION, PROBLEM & EQUATION	
2	5-6 AM	PHYSICAL REVISION, PROBLEM	
3	6- 7AM	ORGANIC REVISION, PROBLEM & EQUATION	
4	8:30- 9:30AM	ONE MARK REVISION BOOK BACK	

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+1, +2 CHEMISTRY & X SCIENCE E.MUTHUSAMYMSc.(Che), MSc.(Psy), MEd., MPhil., MA(Eng.), MA(Tamil), MA(Soc),
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Email: actcnagercoil@gmail.comYOU TUBE: ACTC Chemistry *Subscribe, Like, comment, share & support us***2022-23 +2 BATCH CHEMISTRY CLASS STARTS FROM 02-06-2022 THURSDAY**E.MUTHUSAMY MSc.(Che), MSc.(Psy), MEd., MPhil., MA(Eng.), MA(Soc), MA(P.admin), BLISc., DMLT, PGDCA
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2022-23 +2 CHEMISTRY TUITION CLASS STARTS FROM 02-06-2022 THURSDAY**REDUCED SYLLABUS +1 CHEMISTRY 2021-22****+1 CHEMISTRY QUESTION BANK 2022**

(WITH TEXT BOOK PAGE NUMBER)

Question Bank from

- *GOVT PUBLIC EXAM PREVIOUS YEAR QUESTION PAPER - MARCH 2019(M9), JULY 2019 (J19), SEP2020(S20).*
- *GOVT MODEL QUESTION PAPER 2018-19 (GM19).*
- *Text book inside*

+1 CHEMISTRY REDUCED SYLLABUS 2021-22

MAY BE

35-45% Important Questions & book back

35-50% Creative questions

2-5% Govt model question paper(GMQ) 2018-19

5-10% Govt publicquestion paper MARCH 2019(M19) , JUNE 2019(J19), SEP 2020 (S20)

2-5% First revision question paper-2022(FRQ) .

IMPORTANT QUESTION - QUESTION BANK-2022**LESSON 1 Basic Concepts of Chemistry and Chemical Calculations.**

1. What do you understand by term mole. (J19)
2. What is Avogadro number. (7)
3. Define molar mass.(8)
4. Define molar volume.(8)
5. Define Gram equivalent mass. (8)
6. Equivalent mass of acids, bases, salts, oxidising agents and reducing agents **problem**(9)
7. Calculate equivalent mass of acid.(H₂SO₄(M19), HCl, H₃PO₄(S20))(9)
8. Calculate equivalent mass of base.(KOH, NaOH)(9)
9. Calculate equivalent mass of Oxidising or reducing agent (KMnO₄)(9)
10. Define empirical formula & molecular formula.(10)
11. Determination of Empirical formula **PROBLEMS & book back**(11)
12. An organic compound present in vinegar has 40% carbon, 6.6% of Hydrogen and 53.4 % of Oxygen. Find the empirical formula of the compound. (MQ19)
13. A compound having the empirical formula C₆H₆O has the vapour density 47. Find its Molecular formula. (M19) Calculate the empirical and molecular formula of a compound containing 76.6% carbon, 6.38% of hydrogen and rest oxygen. Its vapour density is 47. (S20)
14. Define stoichiometry. (13)
15. Define Limiting reagent. (17)
16. Define redox reactions.(19)
17. Distinguish between oxidation and reduction.(19)
18. What do you understand by the term oxidation number.(20)

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19. Oxidation number all **problem** (21)
20. Calculate oxidation state of carbon in (i) CH_4 (ii) CCl_4 (21)(MQ19)
21. Calculate oxidation number of oxygen in H_2O_2 . (M19)
22. Redox reactions in terms of oxidation numbers. (22)
23. Prepare well all **PROBLEM QUESTION**.

& study all book back question & answer

Lesson 2 Quantum Mechanical Model of Atom

1. Write note on Rutherford model of an atom. (39)
2. Bohr atom model & limitation. (39)
3. De - Broglie equation. (40) (M19)
4. Davison and Germer experiment. (42)
5. Heisenberg uncertainty principle (42)
6. Calculate the uncertainty in the position of an electron, if the uncertainty in its velocity is $5.7 \times 10^5 \text{ ms}^{-1}$ (J19)
7. Explain different types of quantum numbers. (44) Principal, Azimuthal, Magnetic, Spin.
8. Calculate the orbital angular momentum for d and f orbital. (45) (J15)
9. Shapes of orbitals s, p, d, f. (49)
10. State and explain Pauli's exclusion principle. (52) (M19)
11. Define Aufbau principle (52)
12. Hund's rule (53)
13. Exchange energy. (56)
14. Define orbital? what are the n and l values for $3p_x$ and $4dx^2-y^2$ electron? (J15)
15. Give the electronic configuration of Mn^{2+} , Cr^{3+} , Ni^{2+} and Fe^{3+} .
16. Give the electronic configuration of Copper and Chromium (55)
17. A macroscopic particle of mass one Kg is moving at a velocity 10 cm s^{-1} . calculate its de Broglie wavelength. (MQ19)
18. i) Describe the Aufbau principle.
 (ii) Write the electronic configuration of Fe^{2+} ion.
 (iii) How many radial nodes exist in 2s and 4f orbitals (MQ19)
19. In degenerate orbitals, why do the completely filled and half-filled configurations are more stable than the partially filled configuration? (S20)

PROBLEM- DeBroglie, Heisenberg uncertainty principle & study all book back question & answer

Lesson 3 PERIODIC CLASSIFICATION OF ELEMENTS

1. Define modern periodic law. (73)
2. Nomenclature of elements with atomic number greater than 100. (75)
3. Variation of electronic configuration along the period's. (76)
4. Variation of electronic configuration along in the Groups. (76)
5. Give the general electronic configuration of Lanthanides and actinides. (78) (J19)
6. Define atomic radius (79)
7. Covalent radius (79) calculation (79)

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8. What are isoelectronic ions? Give examples.(bb)
9. Explain the Pauling's method of determination of ionic radius. (83)(MQ19, S20)
10. what is effective nuclear charge ?(79)
11. Effective nuclear charge calculation (81)
12. Define ionisation energy & variation of group , period.(84)
13. Define ionization energy. The first ionization energy of Nitrogen is greater than that of Oxygen- give appropriate reason.(84) (MQ19) (J19)
14. Define electron affinity & variation of group , period.(86)
15. Explain why the electron affinity of Be and N is almost zero.(86) (S20)
16. Define electronegativity & variation of group, period. (87)
17. Define – valency. (88) (M19)
18. Explain diagonal relationship. (90) (M19) & study all book back question & answer

Lesson 4 HYDROGEN

1. Hydrogen Position in periodic table. (101)
2. What are isotopes? Write the names of isotopes of hydrogen.(101)
3. Write note on ortho hydrogen and para hydrogen. (102)
4. How do you convert parahydrogen into ortho hydrogen?(102) (S20) 3MARK
5. Preparation of Deuterium from heavy water. (104)
6. Preparation of Tritium. (104) (M19) 3MARK
7. Explain the exchange reactions of deuterium. (105) (MQ19, S20)
8. Properties of Tritium. (105)
9. Structure of water. (106)
10. What is temporary hardness of water? How is it removed?(109)
11. What is permanent hardness of water? How it will be removed?(109)
12. Chemical properties of heavy water. (111)
13. Uses of heavy water.(111)
14. Write note on Ionic hydrides, Covalent hydrides and Metallic hydrides. (113)

Lesson 5 ALKALI AND ALKALINE EARTH METALS

1. General characteristics of alkali metals. Or 1s block elements.(126)
2. Distinctive (anomalous) behavior of Lithium. (129)
3. Among the alkali metal halides, which is covalent? Explain with reason.(130)(J19)
4. Why blue colour appears during the dissolution of alkali metals in liquid ammonia?(130) J19
5Mi
5. Uses of alkali metals. (131)
6. General characteristics of alkaline earth metals. Or 2s block elements(136)
7. Distinctive (anomalous) behavior of Beryllium. (139)
8. Give any three similarities between beryllium and aluminum. (140) (MQ19, J19)
9. Among the alkaline earth metals BeO is insoluble in water but other oxides are soluble. Why?
(M19)

ANSWER:

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(i) BeO is insoluble in water

BeO is covalent in nature, While other alkaline earth metal oxides are ionic in nature

10. Uses of alkaline earth metals Mg (S20), Ca. (141)

11. Plaster of Paris preparation and uses. (147) (MQ19)

12. Write the balanced equation for each of the following chemical reactions.

(i) Reaction of metallic Lithium with Nitrogen gas (MQ19) & study all book back question & answer

Lesson 6 GASEOUS STATE

1. Boyle's experiment. (160)

2. State Boyle's law. (160)

3. State Charles law. (162)

4. State Gay Lusaac' law. (164)

5. State Avogadro's law. (165)

6. State Dalton's law of partial pressures. (166)

7. State Grahams law of diffusion. (168)

8. Derive ideal gas equation. (165) J19

9. What are ideal gases? (165) (M19)

10. Distinguish between diffusion and effusion. (MQ19)

11. Find the missing parameters (MQ19)

P=1 atm	P=1 atm	P= 1 atm
V ₁ =0.3dm ³	V ₂ =?	V ₃ =0.15dm ³
T ₁ = 200K	T ₂ =300K	T ₃ =? K

Study lesson EXAMPLE problem and Evaluation & study all book back question & answer

Lesson 7 THERMODYNAMICS

1. Write note on system. (187)

2. Define Surrounding & Boundary. (188)

3. What are the types of system. (188)

4. What is isolated system? Give example. (188)

5. Explain closed system with an example. (188)

6. What is open system? Give example. (188)

7. Distinguish between extensive and intensive property? (189) (S20)

8. What is reversible process? Give an ex (189)

9. What is an irreversible process? Give an example. (189)

10. Define adiabatic process? (190)

11. Define isothermal process. (190)

12. Define isobaric process. (190)

13. Define isochoric process. (190)

14. Define cyclic process. (190)

15. What is state and path functions? Give two examples. (190) (MQ19)

16. What is meant by internal energy? (191)

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17. List the characteristics of internal energy. (191)
18. Calculate the work involved in expansion and compression process. (193)
19. Define Zeroth law of thermodynamics (or) Law of thermal equilibrium. (195) (S20)
20. State first law of thermodynamics. (195)
21. Derive the various mathematical statements of the first law. (196)
22. Explain the relation between enthalpy (H) and internal energy (U). (197) (Derive the relation between enthalpy ΔH and internal energy ΔU for an ideal gas. (S20))
23. Define standard heat of formation. (198)
24. Explain thermochemical Equations. (198)
25. Define heat of combustion. (200)
26. Calculate ΔH_f^0 for the reaction $CO_2(g) + H_2(g) \rightarrow CO(g) + H_2O(g)$, given that ΔH_f^0 for $CO_2(g)$, $CO(g)$ and $H_2O(g)$ are -393.5 , -111.31 and $-242 kJ mol^{-1}$ respectively. (200) (MQ19)
27. Define molar heat capacity. Give its Unit. (201) (J19) 3mark
28. Relationship between C_p and C_v (201)
29. State Hess's law. (207)
30. Define lattice energy. (208)
31. Explain Born-Haber cycle. (208)
32. Write note on standard entropy change (212)
33. Define standard entropy of formation. (212)
34. Write note on Entropy change accompanying change of phase. (212)
35. $C_{(s)} + O_{2(s)} \rightarrow CO_{2(g)}$ Calculate the standard entropy change for the above reaction, given the standard entropies of $CO_{2(g)}$, $C_{(s)}$, $O_{2(g)}$ are 213.6 , 5.740 and $205 JK^{-1}$ respectively. (212) (M19)
36. Calculate the entropy change during the melting of one mole of ice into water at $0^\circ C$. Enthalpy of fusion of ice is $6008 J mol^{-1}$. (213) (M19, S20)
37. Define Gibbs free energy & character (214)
38. What are the Criteria for spontaneity of a process. (215)
39. State the third law of Thermodynamics. (218) (M19)

& study all book back question & answer

LESSON 8 PHYSICAL & CHEMICAL EQUILIBRIUM

1. Why the chemical equilibrium is referred to as Dynamic equilibrium. (5)
2. Explain Homogeneous equilibrium and Heterogeneous equilibrium give an example. (5) S20 2M
3. State law of mass action and mention its unit. (5)
4. Define equilibrium constant. Give any one application of equilibrium constant. (MQ19)
5. Derive the relation between K_p and K_c for a general homogeneous gaseous reaction. (6) J195Mi
6. What is equilibrium constant? (6)
7. If $\Delta n_g = 0$, +ve, -ve mention the relationship between K_p and K_c (7)
8. Write a balanced chemical equation for a equilibrium reaction for which the equilibrium constant is given by expression $K_C = \frac{[NH_3]^4 [O_2]^5}{[NO]^4 [H_2O]^6}$
9. Write K_p , K_c and Δn_g (i) $H_{2(g)} + I_{2(g)} \leftrightarrow 2HI_{(g)}$ (ii) $N_{2(g)} + O_{2(g)} \leftrightarrow 2NO_{(g)}$.

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10. Write the Balanced chemical equation for the $K_c = \frac{[CaO_{(s)}][CO_{2(g)}]}{[CaCO_{3(s)}}$ (8) **M19 5Mi**

11. What is reaction quotient? (11) **S20 5Mii**

12. Application of equilibrium constant. (10)

13. How equilibrium constant help to find the direction of chemical equilibrium? (10)

14. How will you predict the feasibility of a reaction using Q value? (Q compare K_c .) (11)

15. Derive the K_P and K_c value for formation of HI (12)

16. Derive the K_P and K_c value for Dissociation of PCl_5 (13)

17. One mole of H_2 and one mole of I_2 are allowed to attain equilibrium mixture contains 0.4 mole of HI. Calculate the equilibrium constant. (13)

18. State Le- Chatelier Principle (16) **(GMQ19, M19 3MARK)**

19. Effect of concentration. (16)

20. Effect of Pressure. (17)

21. Effect of Temperature. (18)

22. Effect of catalyst. (18)

23. What is the effect of added inert gas on the reaction at equilibrium? (19) **J19 2MARK**

Study lesson EXAMPLE problem and Evaluation & study all book back question & answer

LESSON 9. Solutions

1. Define Molality and Molarity (32)

2. Define Normality and Formality (32)

3. Define Mole fraction and Mass percentage (33)

4. Calculate the mole fraction of methanol and water when 0.5 mole of methanol is mixed with 1.5 moles of water. (33) **S20 3MARK**

5. Define volume percentage and mass by volume percentage (34)

6. Define parts per million (34)

7. What are the advantages of using standard solutions? (35)

8. What are standard and working solutions? (35)

9. Define solubility (36)

10. What are the factors influencing the solubility? (36)

11. What is the nature of solute and solvent? (36)

12. How does temperature affect the solubility? (36)

13. Draw and explain the graph obtained by plotting solubility versus temperature for calcium chloride. (37) **J19 5Mii**

14. How does the pressure affect the solubility? (38)

15. State Henry's law (38)

16. NH_3 and HCl do not obey Henry's law. Why? (38) **M19 5Mi**

17. What are the limitations of Henry's law? (40)

18. Define vapour pressure (41)

19. State Raoult's law (43)

20. How will you compare Raoult's law with Henry's law? (45)

21. What are the conditions for ideal solutions? (46)

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22. What are the conditions for Non ideal solutions? (46)
23. Explain the positive deviation of non-ideal solutions (46)
24. Explain the negative deviation of non ideal solutions (47)
25. Explain the factors responsible for deviation from Raoult's law (48)
26. What are colligative properties? (49)
27. What is relative lowering of vapour pressure? (49)
28. Determination of Molar mass weights from relative lowering of vapour pressure (50)
29. What is Ebullioscopic constant? (52)
30. What is Cryoscopic constant? (54)
31. Define osmosis (55)
32. What is osmotic pressure? (55)
33. What is isotonic solution? (56) **M19 3MARK**
34. Determination of molar mass of solute from depression in freezing point (54)
35. Determination of molar mass from osmotic pressure (56)
36. Explain the application of reverse osmosis in water purification (57)
37. Define reverse Osmosis (57)
38. What is abnormal molar mass? (58)
39. What is Van't Hoff factor? (58)
40. Define Molarity. If 5.6 g of KOH is present in 250 ml of the solution, calculate the molarity of the solution. (34) **(MQ19)**
41. Calculate the mass of non-volatile solute (molar mass 80 gmol^{-1}) which should be dissolved in 92 g of toluene is reduced to its Vapour pressure to 90%. **(MQ19)**

Study lesson EXAMPLE problem and Evaluation & study all book back question & answer**LESSON 10. Chemical Bonding**

1. State Octet rule (69)
2. What is covalent bond? (61)
3. Draw the Lewis dot structures for sulphur trioxide. (71) **(MQ19)** Study Lewis dot structure of NH_3 , CH_4 , N_2O_5 , HNO_2 , H_3PO_4 , NO_3^- , SO_4^{2-} , HNO_3 , O_3 .
4. How will you find formal charge of an atom? (72)
5. What are the molecules not obey the octet rule ? (73)
6. What is ionic or electrovalent bond? (74)
7. What is coordinate covalent bond ? (75)
8. What is bond order ? (76)
9. Define bond enthalpy (77)
10. What is resonance? (78)
11. Explain the resonance structure of CO_3^{2-} (78)
12. What is dipole moment? (79)
13. What is polar covalent bond? Give an example (79)
14. CO_2 has zero dipole moment even though two polar bonds. Why? (80)
15. How will you find ionic character? (80)

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16. What is polarization? (80)
17. Linear form of carbon dioxide molecule has two polar bonds. Yet the molecule has zero dipole moment. Why? (80) **J19 2M**
18. State Fajan's rule (81) (**MQ19**)
19. What are the important principles of VSEPR theory? (81)
20. Write the shape and molecular geometry for BF_3 . (82) **S20 2M**
21. Predict the shape of ClF_3 and NH_3 using VSEPR theory. (83) (**MQ19**)
22. Write the structure of the following compounds. (84) **M19 5Mii**
- a) NH_3 (B) BF_3
23. Both C_2H_2 and CO_2 have the same structure. Explain why?. **M19 3MARK**

ANS: **C_2H_2 and CO_2 have same structure**

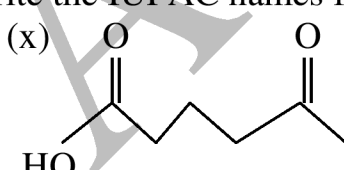
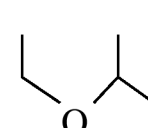
In Both of these compounds carbon undergoes 'SP' hybridization. So C_2H_2 and CO_2 have same shape.

3

Linear structure only. ----- (1)

24. Explain the salient features of VB theory (86)
25. What is sigma, Pi bond? (87)
26. Explain the formation of H_2 , F_2 , HF , O_2 molecule by overlapping of orbitals (87-89)
27. Draw the hybridization in BeCl_2 (90)
28. What is hybridization? (89) Mention the type of hybridisation found in CH_4 . (92) **S20 3M**
29. Draw the hybridization in BF_3 (91), CH_4 (92), PCl_5 (93), SF_6 (94), ethylene molecule (95), acetylene molecule (96)
30. Explain the salient features of MO Theory (99)
31. Explain the molecular formation of the following by MOT i) H_2 ii) Li_2 iii) B_2 iv) C_2 (99) v) N_2 **J20 5Mi** vi) O_2 viii) NO (100)

LESSON 11. FUNDAMENTALS OF ORGANIC CHEMISTRY

- What are characteristics of organic compounds? (111)
- Define homologous series. (112)
- How organic compounds are classified. Based on structure (112)
- How organic compounds are classified. Based on functional groups (112)
- Write the IUPAC names for the following compounds. **J19 5Mi**
 - 
 - $\text{CH}_3 - \text{C} \equiv \text{C} - \underset{\text{Cl}}{\text{CH}} - \text{CH}_3$
 - 
- Give the structural formula for the following compounds. (124) (**M19**) **3MARK Compulsory**
 - m-dinitrobenzene
 - p-dichlorobenzene
 - 1,3,5-Tri-methyl Benzene
- Define isomerism. (132)
- Define chain isomers. Give an example. (132)

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9. Define position isomers. Give an example. (132)

10. Define functional isomers. Give an example. (133)

11. Define metamerism. Give an example. (133)

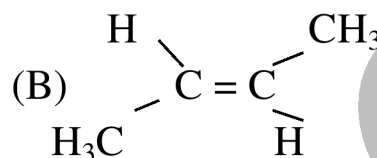
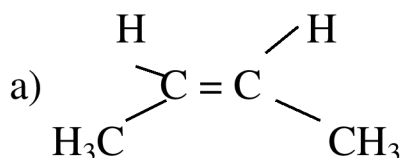
12. Define tautomerism. Give an example. (134)

13. Define Ring chain isomers. Give an example. (134)

14. Define stereoisomerism. (134)

15. Define geometrical isomerism. Draw 2-butene cis, trans isomerism. (135) (S20) 3mark comp

Identify the cis and trans isomer for the following compounds. (135) M19 5Mi



16. Draw Cis – Trans isomers for 2,3- dichloro -2-butene. (135) (MQ19)

17. Draw oximes and azo compounds cis, trans isomerism. (136)

18. Define optical isomerism. Give an example. (137)

19. Explain optical isomerism of Lactic acid. (137)

20. Define enantiomerism. (137)

REVISE ALL Structure IUPAC NAME & study well BOOK BACK QUESTION & ANSWER**LESSON 12 Basic concepts of Organic reactions**

1. What are homolytic and heterolytic cleavages? (162)

2. What is the hybridization of carbon in carbocation? (163)

3. What are Nucleophiles and electrophiles? Give an example (164) (M19)

4. Explain Inductive effect in the organic compounds (166) (J19)

5. Explain Electromeric effect (167) (M19)

6. Explain resonance or mesomeric effect and its types (168)

7. The bond length between all the four carbon atoms is same in 1, 3- butadiene. Explain with reason. (168) J19 3MARK Compulsory

8. Write no bond resonance structure shown by propene. (169) (S20)

Explain hyper conjugation effect (170) (MQ19)

& study well BOOK BACK QUESTION & ANSWER**13. Hydrocarbons**

1. How is hydrocarbons classified? (179)

2. What is Sabatier Sendersen reaction? (184)

3. What is meant by Decarboxylation? decarboxylation of sodium acetate. (184)

4. Wurtz reaction. (184)

5. How will you convert ethyl chloride in to

i) ethane ii) n – butane (bb) (184)

6. Corey house mechanism. (185)

7. Write note on Kolbe's electrolytic method of preparation of alkanes (184)

8. Preparation of methane from Grignard reagent. (185)

9. Write the chemical equations for combustion of propane. (bb) (188)

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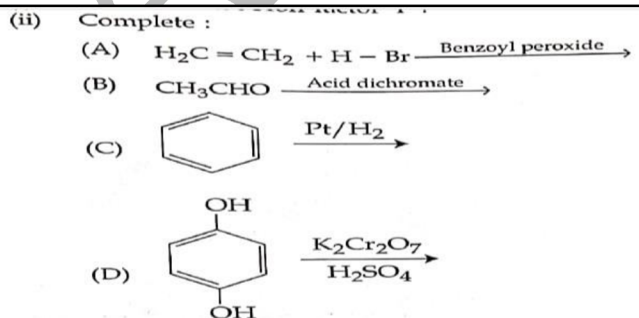
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10. Define pyrolysis. Give an example. (189)
11. Uses of alkane. (190)
12. Geometrical isomerism of 2-butene. (191)
13. How are alkenes prepared from alkynes by Lindlar's catalyst? (192)
14. Suggest a simple chemical test to distinguish propane and propene. (bb) (194)
15. Explain Markownikoff's rule with suitable example. (194)
16. What happens when isobutylene is treated with acidified potassium permanganate? (bb) (198)
17. What happens when ethylene is passed through cold dilute alkaline potassium permanganate. (197-198)
18. An organic compound (A) of molecular formula C_2H_6O , on heating with conc. H_2SO_4 gives compound (B). (B) on treating with cold dilute alkaline $KMnO_4$ gives compound (C). Identify (A), (B) and (C) and explain the reactions. (197) **J20 5Mi**
19. Ozonolysis of alkene. (198) **J19 2M**
20. What is polymerization? preparation of polyethene. (199) **J19 3M**
21. How does Huckel rule help to decide the aromatic character of a compound. (205)
22. Explain the evidence of structure of benzene (207)
23. Explain preparation of benzene (3 methods) (207)
24. Electrophilic substitution reaction of benzene
(Nitration, halogenation, Sulphonation, Methylation, Acetylation) (211-212)
25. How will you get the following products with the given reactants? (210) **M19 5Mi**
- (A) Acetylene \rightarrow Benzene
- (B) Phenol \rightarrow Benzene
- (C) Benzene \rightarrow Toluene
26. The simple Aromatic Hydrocarbon compound (A) reacts with Bromine to give (B). Compound (A) reacts with Raney Ni and gives (C). Identify (A), (B) and (C). (211,215) **M19 5Mii**
27. Wurtz-Fittig reaction. (210)
28. Friedel crafts reaction. (210)
29. Preparation of BHC. & uses. (215)
30. Describe the mechanism of nitration of benzene (211,212,213)
31. Describe the mechanism of Nitration of benzene. (214)
32. Birch reduction (215) **J19 5Mii**
33. Write short notes on ortho, para directors in aromatic electrophilic substitution reactions. (216)
34. Write short notes on meta directors in aromatic electrophilic substitution reactions. (216)

35. **S20 5Mi**

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14. Haloalkanes and Haloarenes

- How are organic halogen compounds classified? (226)
- IUPAC NAME, common name (228)
- Nature of C-X bond in haloalkane. (229)
- How is hydrogen halides prepared using Lucas reagent? (230)
- What is Darzen's halogenation? (231)
- Write note on Finkelstein reaction or (How will you prepare n propyl Iodide from n propyl bromide?) (231)
- Chlorination of methane. (231)
- Write note on Swartz reaction (231)
- Why chlorination of methane is not possible in dark? (231)
- What is Hunsdiccker reaction? (231)
- Physical properties. (Boiling point and melting point, solubility, density) 232
- What is ammonolysis? (233)
- How does haloalkanes reacts with silver nitrite? (234)
- What is Williamson ether synthesis? (234) **M20 3MARK**
- Explain SN2 mechanism. (234)
- Explain SN1 mechanism. (234)
- Explain E2 mechanism. (236)
- Explain E1 mechanism. (236) (Explain the mechanism involved in the elimination reaction of tertiary butyl chloride with alcoholic KOH. **S20 5M**)
- How is Grignard reagent prepared? ALL USES **M20(239)**
- Write note on sandmeyer reaction (242)
- What is Balz Schiemann reaction? (242)
- Raschig process.(242)
- Among the following compounds, o-dichloro benzene and p-dichloro benzene, which has higher melting point? Explain with reason.(243) **J19 5Mii**
- What is Dow's process? (243)
- Write note on Wurtz Fittig reaction (244)
- Write Fittig reaction. (How does chlorobenzene react with sodium in the presence of ether?) (244)
- Discuss the aromatic nucleophilic substitution reaction of chlorobenzene (243)
- What are the uses of chloro benzene? (244)
- A simple aromatic hydrocarbon (A) reacts with chlorine to give Compound (B). Compound (B) reacts with ammonia to give Compound (C) which undergoes carbylamine reaction. Identify (A), (B) and (C) and explain the reactions. (242, 243) **J20 5Mii**

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15	9	9	9	50M	110	15	9	9	50M	110	15	9	9	50M	110	15	9	9	50M	110	

NAME REACTIONS – ORGANIC CHEMISTRY

- Sabatier sendersens reaction.(184)
- Kolbe's electrolytic method.
Alkane(184)
- Wurtz reaction (184)
- Corey house reaction. (185)
- Grignard reagent preparation. (185)
- Aromatization (189)
- Pyrolysis (189)
- Markonikoff's rule. (194 & 231)
- Anti –markonvnikoff's rule or peroxide effect or kharasch addition. (196)
- Action of bayer reagent(197)
- Ozonolysis (198)
- Polymerization (199)
- Wurtz- fittig reaction (210 & 244)
- Friedel crafts reaction (210)
- Friedel crafts reaction acylation (212)
- BHC (215)
- Brich reduction(215)
- Lucas test (230)
- Dorzens halogenation reaction
- Finkelstein reaction (231)
- Swarts reaction (231 & 249)
- Hunsidiccker reaction (231)
- Williamson ether synthesis. (234)
- TEL (238)
- Sandmeyer reaction.(242)
- Gattermann reaction (242)
- Balz schiemann reaction (242)
- Raschig process. (242)
- Dow process. (243)
- Fittig reaction(244)

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