

UNIT-1

(Atomic and molecular structure)

Very Short Answer Type Questions (Section-A)

1. Calculate the bond order of N^{2+} & O_2^+ (2017-18)
2. On the basis of MO theory calculate the bond order of NO be paramagnetic or diagrammatic? (22-23 odd)
3. Draw the molecular energy level diagram for CO. Calculate its bond order and explain its magnetic behavior? (22-23 even)
4. On the basis of molecular orbital theory explain why F_2 is diamagnetic while O_2 is paramagnetic. (2017-18)
5. Arrange the following molecules/ions in increasing order of bond length: O_2 , O_2^- , O_2^{2-} , O_2^+ (sem1-2021-22)
6. Why O_2 is paramagnetic and N_2 is diamagnetic? (sem-1, 2020-21)
7. Arrange molecules or ions in increasing order of bond stability & bond length N_2 , N_2^- , N_2^{2-} , N_2^+ (odd2019-20, even2021-22), (odd2018-19)
8. Explain why He is monatomic and hydrogen is diatomic (sem-2 -2021-2022)
9. Graphite is a good conductor of electricity. Why? (even2017-18)
10. Why graphite is used as lubricant? (even-2018-19)
11. Write any two applications of nano-technology. (odd2018-19)
12. What are nano materials? How they are different from bulk materials? (oddsem-2021-22)
13. Give approach issued for the preparation of nano-materials. (even-2018-19)
14. Write any two examples of green solvents.
15. Write any two examples of non-green solvents.

Long Answer Questions

1. With the help of molecular orbital diagram, explain why hydrogen forms diatomic molecule while helium remains monatomic. (even-2021-22)
2. Draw molecular orbital diagram of CO. Calculate bond order, bond length and magnetic behavior. (2015-16)
3. Calculate the bond order of the following species and report which species has the shortest bond length: NO, NO⁺, NO²⁺, NO⁻ (2015-16, 18-19)
4. With the help of M.O. theory, explain the "paramagnetic" character of O₂ and diamagnetic character of N₂. (sem-2 2021-22)
5. Draw the molecular orbital diagram of NOCO molecule. (17-18)
6. With the help of molecular orbital diagram, explain why NO molecule is paramagnetic. (16-17)
7. Explain BMO and AMO and differentiate between them. Draw molecular orbital diagram of NO⁺. Calculate its bond order and predict its magnetic properties (odd 2018-19)
8. Calculate bond order, magnetic behavior and order of stability of NO, NO⁺, NO⁻. (sem-1, 2020-21)
9. Outline the salient features of the Molecular Orbital Theory on the basis of LCAO principle. Draw MO energy level diagram for the CO molecule. Calculate its bond order and predict its magnetic behavior. (even-2018-19).
10. With the help of molecular orbital diagram, explain formation of NO & O₂ molecule. Calculate their bond order and predict their magnetic behavior. (odd sem- 2019-20, 20-21)
11. With the help of molecular orbital diagram, explain why hydrogen forms diatomic molecule while helium remains monatomic. (even-2021-22)
12. With the help of M.O. theory, explain the "paramagnetic" character of O₂ and diamagnetic character of N₂. (sem-2 2021-22)

13. Calculate bond order, magnetic behavior and order of stability of NO , NO^- , NO^+ . (sem-1, 2020-21)
14. Describe different types of liquid crystals. Discuss the applications of liquid crystals. (22-23 odd)
15. Discuss the classification of liquid crystals. Distinguish between nematic and smectic liquid crystals. Give their important applications. (22-23 even sem.)
16. Write notes on liquid crystals describing classifications and applications of liquid crystals. (sem-1, 2020-21)
17. What do you understand by Mesomorphic state and illustrate it with the help of vapour pressure-temperature curve? Discuss its classification on the basis of temperature and give their important application. (even-2018-19)
18. What are liquid crystals? Differentiate between Nematic and Smectic liquid crystals? (odd 2018-19)
Write application of liquid crystals.
19. Illustrate the concept of liquid crystals.. Classify them on the basis of temperature and mention their important applications. (odd, sem-2021-22, odd-2019-2020)
20. What is a fullerene? Indicating the method of preparation, properties and their applications. (sem-2 -2021-2022)
21. Explain the application of Graphite and comment on the electrical and lubrication property of graphite. (sem-2 -2021-2022)
22. Discussicosahedrons structure and various application of Fullerenes. (even 2017-2018)
23. Write a brief note on fullerenes, discussing their preparation, properties and applications. (22-23 even sem).
24. Give the structure, preparation, properties and applications of an allotropes of carbon having truncated icosahedrons geometry (structure). (odd sem-2021-22, odd-20-19-20)
25. Describe the structure and application of graphite and fullerenes. Explain the reasons for electrical and lubricating properties of graphite. (22-23 odd)
26. What are carbon nano tubes? Discuss the application of nanomaterials. (22-23 odd)
27. Write note son concept and applications of nano-materials. How are they different from bulk material. (16-17)
28. What are nanomaterials? How the physical and chemical properties of nano-particles vary with their size? Write important applications of nanomaterials.
29. What do you understand by green chemistry? Explain 12 principles of green chemistry.
30. What is the concept of atom economy? Explain supercritical CO_2 .
31. Explain the synthesis of adipic acid and paracetamol using conventional and green route process.
32. What would be the environmental impact of green chemistry on society?

UNIT-2 (Spectroscopy)

Short answer questions

1. Explain ,which one will exhibithigher valueof λ_{max} in UV – visible spectra of CH_3COCH_3 and $\text{CH}_2=\text{CHCOCH}_3$ (even sem2018-19)
2. What are Chromophores and Auxochromes? Give examples (odd sem 22-23)
3. A solution shows a transmittance of 20%when kept in a cell of 2.5cm thickness. Calculate itsconcentration, if the molar absorption coefficient is $12000\text{dm}^3\text{mole}^{-1}\text{cm}^{-1}$. (A- even 2021-22)
4. Give any two examples of optically active compounds without chiral centre. (odd 2021-22)
5. Predict the no of signals and their splitting patterns in ^1H NMR of $\text{CH}_3\text{CCl}_2\text{CH}_3$ and $\text{CH}_3\text{OCH}_2\text{CH}_3$ (even sem 22-23)
6. IRSpectraareoftencharacterizedas‘fingerprint’ region?Commenton (odd,2019-20)
7. Two isomers X and Y having molecular formula $\text{C}_3\text{H}_6\text{O}$ give IR band near 3550 cm^{-1} and 1717 cm^{-1} respectively. Assign structural formula to X and Y consistent with their IR absorption band. (even sem-22-23)
8. What are Chiral Drugs ? Give examples of Chiral drugs? (odd sem 22-23)

Long answer questions

1. State and derive Lambert's - Beer's Law . The %transmittance of an aqueous solution of unknown compound is 20% at 25°C and 300nm for a 2×10^{-5} M solution in a 4 cm cell.Calculate the absorbance.(A)and the molar extinction coefficient(ϵ).
(Bodd,2019-20)
2. What type of electronic transition is involved in UV – visible spectroscopy? Explain the absorption and intensity shift in the UV-spectroscopy and support with examples. Illustrate the effect of polar and nonpolar solvent on $\sigma - \sigma^*$ transition in acetone?
(even 2018-19)
3. Write the criteria for a molecule to show a , IR, and UV spectra . Give possible the electronic transitions (UV spectra) in $\text{CH}_3\text{CH}_2\text{CH}_3$, $\text{CH}_3\text{CH} = \text{CH}_2$, $\text{CH}_3\text{CH} = \text{O}$, and $\text{CH}_3\text{-CH} = \text{CHCH} = \text{CH-CH}_3$. How many fundamental vibrational degrees of freedom expected for the molecules: CO_2 , H_2O , and C_2H_2 ?
(odd sem.2020-21)
4. Write notes on chromophores, and auxochromes.Explain transition in UV spectra.
(Odd sem.2021-22)
5. Identify the chromophoric groups present in cyclopentane , toluene , butanone and methanethiol in UV-spectroscopy?
(odd 22-23)
6. How do Auxochromes increase the coloring power of Chromophores?
(even-22-23)
7. Write notes on (i) UV shift (ii) Application of IR spectroscopy (iii) Molecular vibrations.
(odd 2019-20)
8. Which of the following spectroscopy(IR) would you use to measure the vibration frequency of the following bonds?(i) Stretching frequency of ^{14}N and ^{15}N .(ii) The C=O in ethyne ($\text{CH} \equiv \text{CH}$).
(Odd sem-2019-20)
9. Among H_2 , HCl , CO_2 , H_2O molecules identify which will be IR active and why? Explain different mode of vibrations observed in CO_2 molecule. Out of the following pairs which one is expected to absorb at higher frequency for stretching vibrations? Also state reasons:(i) $\text{HCHO}, \text{CH}_3\text{CHO}$,(ii) $\text{CH} \equiv \text{CH}, \text{C}=\text{C}$,(iii) $\text{O-H}, \text{C-C}$.
(C-even sem.2018-19)
10. Define IR spectroscopy? Describe various molecular vibrations in the IR technique and the application of IR spectroscopy.
(even sem.2021-22)
11. Explain the terms - (i)Chemical shift (ii) Shielding effects and de-shielding effects in NMR Spectroscopy.
(odd sem.2021-22)
12. Calculate the number of peaks and area under each peak in the NMR spectrum of a

sample of $\text{CH}_3\text{-O-CH}_2\text{CH}_3$

13. Predict the NMR spectrum of Ethyl alcohol.

(even sem.2021-22)

14. (a) Why is TMS used as an internal standard in NMR spectroscopy? Two isometric compound A and B have molecular formula $\text{C}_{10}\text{H}_{14}$. The ^1H NMR spectra of these isomers gave the following data:

Isomers A: $\delta 1.30(9\text{H}, s)$; $\delta 7.28(5\text{H}, s)$

Isomers B : $\delta 0.88(6, H, d)$; $\delta 1.86(1\text{H}, m)$; $\delta 2.45(2\text{H}, d)$;
 $\delta 7.12(5\text{H}, s)$

- b (i) Explain the basic principle of IR spectroscopy . What is the significance of Fingerprint region in IR spectroscopy? (odd sem 22-23)

15. (a) What is shielding and deshielding in NMR spectroscopy? A compounds having molecular formula $\text{C}_4\text{H}_9\text{Br}$ gave the following signals in its HNMR spectra:

$\delta 1.04(6\text{H}, d)$

$\delta 1.95(1\text{H}, m)$

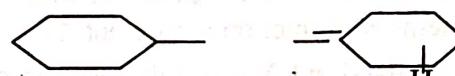
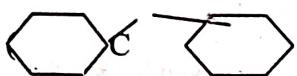
$\delta 3.33(2\text{H}, d)$

Giving reasons assign the structures for the compound.

- (b) (i) A diene (molecular formula C_4H_6) shows an intense peak at $\lambda_{\max} 217 \text{ nm}$ while another diene (molecular formula C_5H_8) shows an intense peak at $\lambda_{\max} 175 \text{ nm}$ in their UV spectra . Giving proper explanation assign the structures to the two dienes.

- (ii) Why the at λ_{\max} for the diene (I) is observed at a lower nm than diene (II)? (even sem 22-23)

(i)



H

16. Giving examples explain optical isomerism shown by compounds without any chiral carbon. Draw all the possible stereo isomers for 1, 2- dimethylcyclopropane and 1, 3-dimethyl cyclobutane. Comment on the optical activity of these stereo isomers.

17. Asymmetrically substituted compounds having even number of cumulative double bonds exhibit optical isomerism whereas compounds having odd number of cumulative double bond exhibit geometrical isomerism. Explain giving proper reasons.

18. What are Altropoisomerism ? Give five examples of compounds showing optical isomerism in the absence of Chirals carbons. (odd sem 22-23)

Unit-3 (Electrochemistry, Batteries & Corrosion)

Short Answer Questions

1. Give reactions of lead -acid storage cell, when it behaves like galvanic cell. (A even sem 2017-18)
2. The standard reduction potential of three metallic cat ions X, Y, Z, are 0.52, -3.03, and -1.18 v. respectively arrange them in decreasing order of their reducing power. (A oddsem / 2017-18)
3. Calculate the EMF of the cell $Zn(s) | Zn^{2+} \text{ aq (0.1M)} || Cu^{2+} (0.2M) | Cu(s)$ Standard reduction potential of Zn^{2+} & Cu^{2+} are -0.76 v and 0.34. (eve. 2021- 2022)
4. What is electrochemical series? What is the potential of a half cell consisting of zinc electrode in 0.01 $ZnSO_4$ solution at $25^\circ C$. $E=0.763V$. (even sem 22-23)

5. Give important applications of electrochemical series? (odd. sem 22-23)
6. Explain why part of a nail inside the wood undergoes corrosion easily. (oddsem19-20)
7. Explain why iron corroded while gold does not. less reactive metal in reactivity series & doesn't react
8. Explain why a pure metal rod half immersed vertically in water starts corroding at the bottom? (A -even sem17-18)
9. Why a block of magnesium attached through an insulated metallic wire to the hull of the ship? (A -oddsem15-16) b
10. Comment on the use of Al in place of zinc (Zn) for cathodic protection of iron from rusting (A -oddsem18-19)
11. Explain why iron corroded while gold does not? (-oddsem15-16)
12. Distinguish between corrosion of Al and Mg. Mg more reactive metal than Al which readily reacts with
13. How much rust (Fe_2O_3) will be formed when 100 kg of iron have rusted away? Other elements are present including H₂O and O₂. (even 21-22)
14. Explain why an underground iron pipe is connected through an insulated wire to a block of zinc metal. Al less reactive res

Long answer questions

most common

- What are Secondary batteries? Discuss the various reactions involved during the charging and discharging of lead acid battery with applications of lead acid battery. (even sem 18-19, 21-22)
- What are secondary cells? Explain classification and applications of secondary cells (lead storage battery). (even sem 22-23)
- ~~Give the principle, construction and working of galvanic cell.~~ (2017-18)
- Consider a cell reaction (even. 2020-21)



Standard reduction potential of Zn^{2+} & Cu^{2+} are -0.76 v and 0.34v. Write half cell reaction, full cell reaction, and calculate EMF of cell.

- Explain the setting and hardening of cement with relevant chemical reactions involved during the process. ? (odd. sem 22-23)
- Discuss the construction and chemistry of charging / discharging of lead acid battery. (even sem 22-23)
- ~~Describe electrochemical theory of corrosion .How corrosion can be prevented by sacrificial anodic protection and immersed current cathodic protection?~~ (c-oddsem19-20), (c-even sem18-19)
- ~~Describe the mechanism of electrochemical (wet) corrosion with help of reactions? Explain the cathodic protection method for the prevention of corrosion.~~ (c -oddsem18-19), (eve-2021-22), (c-even sem-1917-1918)
- Discuss the electrochemical theory of corrosion along with equations. Explain why a sheets of zinc metal are hung around a ship of hull of ocean going ships- (c -oddsem15-16)
- Explain the sacrificial anodic and immersed current cathodic protection method for prevention of corrosion. (c –even sem17-18)
- ~~Explain the mechanism of hydrogen evolution and oxygen absorption in electrochemical corrosion.~~ (c even -sem15-16)
- What is electrochemical corrosion? Write down the mechanism involved in the said corrosion. (even sem 22-23)
- What are corrosion inhibitors? Explain with examples how anodic and cathodic inhibitors provide protection against corrosion. (even sem 22-23)
- Define corrosion. How can corrosion be minimized by sacrificial anodic protection and impressed current cathodic protection methods? (even sem 22-23)
- Discuss the mechanism of electrochemical corrosion of iron with evolution of hydrogen .What will happen if a zinc rod is vertically half submerged under water ? (even sem 22-23)
- (a) Discuss the mechanism of electrochemical theory of corrosion by absorption of oxygen. What effect will increased oxygen supply have on such corrosion ? How can corrosion be minimized by proper design ? (odd sem 22-23)
- (b) Discuss the difference between anodic and cathodic metallic coatings. Explain the process of galvanization and electroplating? What will happen if an iron ship travelling in a sea is attached through an insulated metallic wire to a small sheet of magnesium? (odd. sem 22-23)

Unit-4(Water analysis and Fuels)

Short answer questions - (section -A)

1. A water sample contains 10 ppm of CaCl_2 , 3.2 ml/gm of NaCl , 21.1⁰Fr. of Al_2O_3 . Calculate the total hardness of water. (sem-1:2019-20)
2. Calculate the hardness of water sample containing impurity of _____ (Sem1-2021-22).

$\text{Ca}(\text{HCO}_3)_2 = 81 \text{ mg/l}$. Give your answer ⁰ False

3. A water sample is found to contain 40.5 mg/L $\text{Ca}(\text{HCO}_3)_2$; 14.6 mg/L $\text{Mg}(\text{HCO}_3)_2$; 22.2 mg/L CaCl_2 ; 24 mg/L MgSO_4 and 18 mg/L NaCl . Calculate the temporary and permanent hardness of water sample (odd sem -22-23)
4. Sample of coal has following composition by mass, C=70%, H=10%, N=3%, S=2%, ash=7%, O=8%. Calculate HCV and LCV of fuel. (sem-1:2019-20)
5. Calculate GCV of the coal sample having C=80%, H=9%, O=4%, N=1.5%, S=2.5% and ash=3% (sem-2:2018-19)
6. How does gross calorific value differ from net calorific value? (odd -22-23)
7. Differentiate between Gross and Net calorific value. (even sem -22-23)

Long answer questions

1. Calculate the amount of lime and soda required for 125000 litre of water , with following analysis using 10 ppm of sodium aluminate (NaAlO_2) as coagulant
analysis of raw water: $\text{Ca}^{2+} = 20 \text{ ppm}$, $\text{Mg}^{2+} = 18 \text{ ppm}$, dissolved $\text{SO}_4^{2-} = 24 \text{ ppm}$, and $\text{HCO}_3^- = 183 \text{ ppm}$. Analysis of treated water: $\text{CO}_3^{2-} = 45 \text{ ppm}$, $\text{OH}^- = 34 \text{ ppm}$
(a) Outline demineralization process of water softening. Compare the merits and demerits of Zeolite process with demineralization process.
(b) Write the reactions involved in calcination treatment of water. (sem-1:2019-20)
2. Write different chemical reactions taking place in lime -soda process. A sample of water analysis give following result: Analysis of raw water: $\text{Ca}^{2+} = 80 \text{ mg/l}$, $\text{Mg}^{2+} = 24 \text{ mg/l}$, $\text{CO}_2 = 33 \text{ mg/l}$, $\text{HCO}_3^- = 132 \text{ mg/l}$, $\text{H}^+ = 10 \text{ mg/l}$ & $\text{NaCl} = 4.3 \text{ ppm}$. Analysis of treated water : $\text{CO}_3^{2-} = 12 \text{ mg/l}$, and $\text{OH}^- = 34 \text{ mg/l}$. Calculate the quantity of lime (74% pure) and soda (92% pure) needed for softening 50000L of water. (odd Sem-2021-22)
3. (a) (i) write the process of lime-soda softening.
(ii) Calculate the amount of lime and soda required for the treatment of 20000 liters of water whose analysis is as follows:-
 $\text{Ca}(\text{HCO}_3)_2 = 40.5$; $\text{Mg}(\text{HCO}_3)_2 = 36.5 \text{ ppm}$; $\text{MgSO}_4 = 30 \text{ ppm}$; $\text{CaCl}_2 = 27.75 \text{ ppm}$.
(b) Explain the process of determination of calorific value using Bomb calorimeter method. (even-2021-22)
4. Write the chemical name and molecular formula of zeolite . Give different chemical reactions taking place in zeolite process. A zeolite softener was regenerated by passing 50 liters of NaCl solution having strength of 14.625 g/l of NaCl. Calculate the hardness of water if 10000 liters of hard water was softened by using this zeolite. (odd Sem-2021-22)
5. Explain the zeolite process of water softening. What are the advantages and limitations of this process? Calculate the amount of lime and soda required for the treatment of 10,000 litres of water whose analysis is as follows (in mg/L): $\text{Mg}(\text{HCO}_3)_2 = 73$; $\text{CaSO}_4 = 102$; $\text{MgCl}_2 = 95$; $\text{MgSO}_4 = 24$; $\text{Ca}(\text{HCO}_3)_2 = 1215$; $\text{NaCl} = 55$. (odd sem -22-23)
6. How are scales formed in boilers? Discuss four advantages of scale formation in boilers. The hardness of 10,000 litres of water sample was removed by passing it through a zeolite softener . The zeolite softener then required 200 litres of sodium chloride solution containing 200 g/L of NaCl for regeneration. Calculate the hardness of water sample.) (even sem -22-23)
7. Discuss the principle and working of bomb calorimeter. A sample of coal contains C=80%, H=15%, and ash=5%. The following data were obtained, when the above coal was tested in bomb calorimeter: Weight of coal burnt= 0.98 gm, Weight of water taken=1000 gm
Water equivalent of bomb, thermometer, stirrer, and calorimeter = 2500 gm
Rise in temperature= 2.5°C Fuse wire correction= 8 cal
Acid correction= 50 cal
Cooling correction= 0.02°C
Calculate gross and net calorific values of the coal. (if the latent heat of vaporization is 580 cal /gm). (sem-1:2019-20& odd 2021-22)
8. Describe proximate analysis of fuels. A coal sample has the following analysis (sem-1:2018-19)

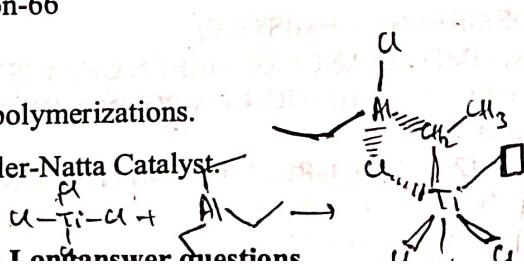
by weight: C = 90%, N = 0.5%, O = 3.0%, S = 0.5% and ash = 2.5%. Net calorific value of the coal was found to be 8,490.5 Kcal /Kgm. Calculate the percentage of hydrogen and gross calorific value.

19,eve-2021-22

9. What is rank of coal? Describe proximate and ultimate analysis of coal. (sem-1:2017-18)
10. What do you understand by the terms GCV and NCV? Explain the construction and working of bomb calorimeter. (eve.2021-22)
11. 4.2 gm of a coal sample was Kjeldahalized and evolved ammonia gas was absorbed in 30 ml of 0.1N H₂SO₄. After absorption excess acid required 5 ml of 0.1N NaOH for neutralization. Calculate the % of nitrogen in a coal sample. (Sem1-2021-22)
12. (a) A sample of hard water has hardness 500 ppm, express the hardness in °Fr. and °Cl.
(b) 0.4 gm of a coal sample was used in bomb calorimeter for the determination of calorific value. The ash formed in the bomb calorimeter was extracted with acid and the acid extracted was treated with BaCl₂ solution and the precipitate of BaSO₄ was formed
13. The ppt was filtered, dried and weighed. The weight of precipitate was 0.04 gm. Calculate the percentage of sulphur in the sample. (even-2021-22)

Unit-5 (Polymers)

Short answer questions

1. Simple molecules do not polymerize. Justify. (A-oddsem19-20)
2. Illustrate various applications of composites. (A-oddsem19-20)
3. Write the monomer of (a) Neoprene (b) Terylene. (A-oddsem18-19)
4. Why dry ether solvent important for the preparation of Grignard reagent? (odd sem18-19)
5. What are Bio degradable polymers? Discuss their applications? (A-evensem18-19)
6. What do you understand by Polymer Blends? (A-evensem18-19)
7. What do you understand by the term functionality of a polymer? Explain by taking an example. (A-evensem17-18)
8. Will you prefer to polymerize acrylonitrile under anionic and cationic conditions? (A-oddsem17-18)
 $\text{CH}_2 = \text{CH-CN}$. Under anionic the active centre of propagating species is -ve charged. Monomer reacts with E^- and nitrile group.
9. Give the structure of FOUR compounds used as initiators in Free Radical polymerization. (even2022-23)
10. Write down chemical units of Nylon and polystyrene.
11. Explain why Teflon is highly chemical resistant. (oddsem.2020-21)
Strong C-F bonds extremely resistant to attack by reagent make inert.
12. Low density and high density polyethylene differ in density. Why?
Molecules more loosely packed. less dense, stain & resistant, electrical insulating & waterproof.
13. Discuss the preparation and uses of PTFE. (oddsem.2022-23)
14. Discuss the preparation and uses of nylon -6,6. (evensem.2022-23)
15. Examples of each organo metallic compound and biodegradable polymers.
16. Draw stereoregular and stereoirregular forms of polystyrene.
17. Write down the monomer of Buna-S and polystyrene. nylon-66 sem2-(2021-22)
18. Natural rubber needs vulcanization. Give reasons. (Aodd15-16)
19. Give two examples of initiators used for free radical polymerizations. (Aodd15-16)
20. Write the structure of ferrocene, Ziese's Salt and Ziegler-Natta Catalyst. (A-14-15),22
 Ti-Al 

- Differentiate between (i) Thermoplastic and thermosetting (ii) Addition condensation polymerization. (B-oddsem17-18)
- (a) Give preparation, properties & application of Buna-N and Terylene. (e.sem17-18)
- (b) Explain intrinsic conducting polymers. (B-evensem17-18)
- What are conducting polymers? Discuss the classification and applications of conducting polymers? (B-evensem18-19), (C -evensem.2021-22)
- What are conducting polymers? Classify conducting polymers and mention their important applications (B-oddsem19-20,2021-22).
- Write down the preparations properties and applications of (i) Buna-N (ii) Nylon-6,6 (iii) Terylene and (iv) Kevlar
- Writes notes on (i) polymer blends and (ii) polymer composites.
- Differentiate between elastomers and fibres? Give the preparation, properties and uses of Buna-S, Buna-N and Neoprene. (oddsem.-18-19), sem2-(2021-22)
- What are organometallic compounds? Write their classification, preparations and applications. (sem2-2021-22)
- What are organo metallic compounds? Discuss the preparation of Grignard Reagent. Predict the final product obtained when C_2H_5MgBr reacts with (i) $HCHO$ (ii) CH_3CHO (iii) $(CH_3)_2Co$? (oddsem.2022-23, 2018-19, 19-20)
- Explain with equations preparations of acid, ketones, alcohols, alkanes and Organometallic compounds from Grignard reagent. (even sem-2020-2021)
- Differentiate between Chain Growth and Step Growth polymerization.
- Outline the process of vulcanization of rubber. Describe the preparation, important properties and uses of Butyl rubber or Kevlar. (oddsem.2022-23)
- Differentiate between Thermosetting and Thermoplastic polymers. (oddsem.2022-23)
- Giving examples write a brief note on conducting polymers.
- Explain the conductivity of polymers with conjugated π -electron system. How is the conductivity enhanced by doping.
- What are fibers and their properties? Give different type of fibers' with examples.
- How do natural biodegradable polymers undergo biodegradation? (oddsem18-19)
- Distinguish between addition and condensation polymerization. Give monomers and one use each of PMMA, Polyethylene, Bakelite, PVC, Nylon-6,6, Buna-S.
- What are composite materials? Give the classifications of composite materials. (Oddsem-2020-2021)
- Predict the final product obtained when $LiAlH_4$ reacts with : (evensem.2022-23)
 - CH_3CHO
 - CH_3CN
 - $CH_3COOC_2H_5$
 - $CH_3COC_2H_5$
 - CH_3COOH
 - CH_3N_3
 - CH_3CHCH_2O (epoxide)
- (a) What are biodegradable polymers? Write a note on: (i) Polynucleotide's (ii) Buna-S (evensem.2022-23)
 - Differentiate between thermoplastic and thermosetting polymers. Discuss the preparation and uses of phenol Formaldehyde resin.