

**GOVERNMENT HIGHER SECONDARY SCHOOL-KEERIPATTY****XII- CHEMISTRY – QUESTION BANK****UNIT-1**

1. What are the differences between minerals and ores?
2. What are the various steps involved in extraction of pure metals from their ores?
3. What is the role of limestone in the extraction of iron from its oxide  $\text{Fe}_2\text{O}_3$ ?
4. Which type of ores can be concentrated by froth floatation method? Give two examples for such ores.
5. Out of coke and CO, which is better reducing agent for the reduction of ZnO? Why?
6. Describe a method for refining nickel.
7. Explain zone refining process with an example using the Ellingham diagram given below
8. (A) Predict the conditions under which
  - (i) Aluminium might be expected to reduce magnesia.
  - (ii) Magnesium could reduce alumina.(B) Carbon monoxide is more effective reducing agent than carbon below 983K but, above this temperature, the reverse is true –Explain.
  - (c) it is possible to reduce  $\text{Fe}_2\text{O}_3$  by coke at a temperature around 1200K
9. Give the uses of zinc.
10. Explain the electrometallurgy of aluminium.
11. Explain the following terms with suitable examples. (i) Gangue (ii) slag
12. Give the basic requirement for vapour phase refining.
13. Describe the role of the following in the process mentioned.
  - (i) Silica in the extraction of copper
  - (ii) Cryolite in the extraction of aluminium.
  - (iii) Iodine in the refining of Zirconium.
  - (iv) Sodium cyanide in froth floatation.
14. Explain the principle of electrolytic refining with an example.
15. The selection of reducing agent depends on the thermodynamic factor: Explain with an example.
16. Give the limitations of Ellingham diagram.
17. Write a short note on electrochemical principles of metallurgy.

**UNIT-2**

1. Write a short note on anomalous properties of the first element of p-block.
2. Describe briefly allotropism in p- block elements with specific reference to carbon.

3. Boron does not react directly with hydrogen. Suggest one method to prepare diborane from  $\text{BF}_3$ .
4. Give the uses of Borax.
5. What is catenation ? describe briefly the catenation property of carbon.
6. Write a note on Fisher tropesch synthesis.
7. Give the structure of CO and  $\text{CO}_2$ .
8. Give the uses of silicones.
9.  $\text{AlCl}_3$  behaves like a lewis acid. Substantiate this statement.
10. Describe the structure of diborane.
11. Write a short note on hydroboration.
12. Give one example for each of the following
  - (i) icosogens (ii) tetragen (iii) prictogen (iv) chalcogen
13. Write a note on metallic nature of p-block elements.
14. How will you identify borate radical?
15. Write a note on zeolites.
16. How will you convert boric acid to boron nitride?
17. A hydride of 2<sup>nd</sup> period alkali metal (A) on reaction with compound of Boron (B) to give a reducing agent (C). identify A , B and C.
18. A double salt which contains fourth period alkali metal (A) on heating at 500K gives (B). aqueous solution of (B) gives white precipitate with  $\text{BaCl}_2$  and gives a red colour compound with alizarin. Identify A and B.
19. CO is a reducing agent . justify with an example

### UNIT-3

1. What is inert pair effect?
2. Chalcogens belongs to p-block. Give reason.
3. Explain why fluorine always exhibit an oxidation state of -1?
4. Give the oxidation state of halogen in the following.
  - a)  $\text{OF}_2$  b)  $\text{O}_2\text{F}_2$  c)  $\text{Cl}_2\text{O}_3$  d)  $\text{I}_2\text{O}_4$
5. What are interhalogen compounds? Give examples.
6. Why fluorine is more reactive than other halogens?
7. Give the uses of helium.
8. What is the hybridisation of iodine in  $\text{IF}_7$ ? Give its structure.
9. Give the balanced equation for the reaction between chlorine with cold NaOH and hot NaOH.
10. How will you prepare chlorine in the laboratory?

11. Give the uses of sulphuric acid.
12. Give a reason to support that sulphuric acid is a dehydrating agent.
13. Write the reason for the anomalous behaviour of Nitrogen.
14. Write the molecular formula and structural formula for the following molecules. a) Nitric acid b) dinitrogen pentoxide c) phosphoric acid d) phosphine
15. Give the uses of argon.
16. Write the valence shell electronic configuration of group-15 elements.
17. Give two equations to illustrate the chemical behaviour of phosphine.
18. Give a reaction between nitric acid and a basic oxide.
19. What happens when  $\text{PCl}_5$  is heated?
20. Suggest a reason why HF is a weak acid, whereas binary acids of the all other halogens are strong acids.
21. Deduce the oxidation number of oxygen in hypofluorous acid – HOF.
22. What type of hybridisation occur in a)  $\text{BrF}_5$  b)  $\text{BrF}_3$

#### UNIT-4

1. What are transition metals? Give four examples.
2. Explain the oxidation states of 4d series elements.
3. What are inner transition elements?
4. Justify the position of lanthanides and actinides in the periodic table.
5. What are actinides? Give three examples.
6. Why  $\text{Gd}^{3+}$  is colourless?
7. Explain why compounds of  $\text{Cu}^{2+}$  are coloured but those of  $\text{Zn}^{2+}$  are colourless.
8. Describe the preparation of potassium dichromate.
9. What is lanthanide contraction and what are the effects of lanthanide contraction?
10. What are interstitial compounds?
11. Calculate the number of unpaired electrons in  $\text{Ti}^{3+}$ ,  $\text{Mn}^{2+}$  and calculate the spin only magnetic moment.
12. Write the electronic configuration of  $\text{Ce}^{4+}$  and  $\text{Co}^{2+}$ .
13. Explain briefly how +2 states becomes more and more stable in the first half of the first row transition elements with increasing atomic number.
14. Which is more stable?  $\text{Fe}^{3+}$  or  $\text{Fe}^{2+}$  explain.
15. Explain the variation in  $E^0_{\text{M}^{3+}/\text{M}^{2+}}$  3d series.
16. Compare lanthanides and actinides.
17. Explain why  $\text{Cr}^{2+}$  is strongly reducing while  $\text{Mn}^{3+}$  is strongly oxidizing.
18. Compare the ionization enthalpies of first series of the transition elements.

19. Actinoid contraction is greater from element to element than the lanthanoid contraction, why?
20. Out of  $\text{Lu}(\text{OH})_3$  and  $\text{La}(\text{OH})_3$  which is more basic and why?
21. Why europium (II) is more stable than Cerium (II)?
22. Why do zirconium and Hafnium exhibit similar properties?
23. Which is stronger reducing agent  $\text{Cr}^{2+}$  or  $\text{Fe}^{2+}$ ?
24. The  $E^0_{\text{M}^{2+}/\text{M}}$  value for copper is positive. Suggest a possible reason for this.
25. predict which of the following will be coloured in aqueous solution  $\text{Ti}^{2+}$ ,  $\text{V}^{3+}$ ,  $\text{Sc}^{4+}$ ,  $\text{Cu}^+$ ,  $\text{Sc}^{3+}$ ,  $\text{Fe}^{3+}$ ,  $\text{Ni}^{2+}$  and  $\text{Co}^{3+}$ .
26. Describe the variable oxidation state of 3d series elements.
27. Which metal in the 3d series exhibits +1 oxidation state most frequently and why?
28. Why first ionization enthalpy of chromium is lower than that of zinc?
29. Transition metals show high melting points why?

#### UNIT-5

1. Write the IUPAC names for the following complexes.
  - i)  $\text{Na}_2[\text{Ni}(\text{EDTA})]$
  - ii)  $[\text{Ag}(\text{CN})_2]^-$
  - iii)  $[\text{Co}(\text{en})_3](\text{SO}_4)_3$
  - iv)  $[\text{Co}(\text{ONO})(\text{NH}_3)_5]^{2+}$
  - v)  $[\text{Pt}(\text{NH}_3)_2\text{Cl}(\text{NO}_2)]$
2. Write the formula for the following coordination compounds.
  - a) potassiumhexacyanidoferrate(II)
  - b) pentacarbonyliron(0)
  - c) pentaamminenitrito  $-\kappa -\text{N}$ -cobalt(III)ion
  - d) hexaamminecobalt(III)sulphate
  - e) sodiumtetrafluoridodihydroxidochromate(III)
3. Arrange the following in order of increasing molar conductivity
  - i)  $\text{Mg}[\text{Cr}(\text{NH}_3)_5\text{Cl}_5]$
  - ii)  $[\text{Cr}(\text{NH}_3)_5\text{Cl}]_3$
  - iii)  $[\text{CoF}_6]_2$
  - iii)  $[\text{Cr}(\text{NH}_3)_3\text{Cl}_3]$
4.  $\text{Ni}^{2+}$  is identified using alcoholic solution of dimethyl glyoxime. Write the structural formula for the rosy red precipitate of a complex formed in the reaction.
5.  $[\text{CuCl}_4]^{2-}$  exists while  $[\text{CuI}_4]^{2-}$  does not exist why?
8. Give an example of coordination compound used in medicine and two examples of biologically important coordination compounds.
9. Based on VB theory explain why  $[\text{Cr}(\text{NH}_3)_6]^{3+}$  is paramagnetic, while  $[\text{Ni}(\text{CN})_4]^{2-}$  is diamagnetic.
9. Draw all possible geometrical isomers of the complex  $[\text{Co}(\text{en})_2\text{Cl}_2]^+$  and identify the optically active isomer.
10.  $[\text{Ti}(\text{H}_2\text{O})_6]^{3+}$  is coloured, while  $[\text{Sc}(\text{H}_2\text{O})_6]^{3+}$  is colourless- explain.
11. Give an example for complex of the type  $[\text{Ma}_2\text{b}_2\text{c}_2]$  where a, b, c are monodentate ligands and give the possible isomers.
12. Give one test to differentiate  $[\text{Co}(\text{NH}_3)_5\text{Cl}]\text{SO}_4$  and  $[\text{Co}(\text{NH}_3)_5\text{SO}_4]\text{Cl}$ .

13. In an octahedral crystal field, draw the figure to show splitting of d orbitals.
14. What is linkage isomerism? Explain with an example.
15. Write briefly about the applications of coordination compounds in volumetric analysis.
16. Classify the following ligand based on the number of donor atoms.  
a)  $\text{NH}_3$  b) en c)  $\text{ox}^{2-}$  d) triaminotriethylamine e) pyridine
17. Give the difference between double salts and coordination compounds.
18. Write the postulates of Werner's theory.
19.  $[\text{Ni}(\text{CN})_4]^{2-}$  is diamagnetic, while  $[\text{NiCl}_4]^{2-}$  is paramagnetic, explain using crystal field theory.
20. Why tetrahedral complexes do not exhibit geometrical isomerism.
21. Explain optical isomerism in coordination compounds with an example.
22. What are hydrate isomers? Explain with an example.
23. What is crystal field splitting energy?
24. What is crystal stabilization energy (CFSE) ?
25. A solution of field  $[\text{Ni}(\text{H}_2\text{O})_6]^{2+}$  is green, whereas a solution of  $[\text{Ni}(\text{CN})_4]^{2-}$  is colorless - Explain
26. Discuss briefly the nature of bonding in metal carbonyls.
27. What is the coordination entity formed when excess of liquid ammonia is added to an aqueous solution of copper sulphate?
28. On the basis of VB theory explain the nature of bonding in  $[\text{Co}(\text{C}_2\text{O}_4)_3]^{3-}$
29. What are the limitations of VB theory?
30. Write the oxidation state, coordination number, nature of ligand, magnetic property and electronic configuration in octahedral crystal field for the complex  $\text{K}_4[\text{Mn}(\text{CN})_6]$ .

#### UNIT-6

1. Define unit cell.
2. Give any three characteristics of ionic crystals.
3. Differentiate crystalline solids and amorphous solids.
4. Classify the following solids a.  $\text{P}_4$  b. Brass c. diamond d. NaCl e. Iodine
5. Explain briefly seven types of unit cell.
6. Distinguish between hexagonal close packing and cubic close packing.
7. Distinguish tetrahedral and octahedral voids.
8. What are point defects?
9. Explain Schottky defect.
10. Write short note on metal excess and metal deficiency defect with an example.
11. Calculate the number of atoms in a fcc unit cell.

12. Explain AAAA and ABABA and ABCABC type of three dimensional packing with the help of neat diagram.
13. Why ionic crystals are hard and brittle?
14. Calculate the percentage efficiency of packing in case of body centered cubic crystal.
15. What is the two dimensional coordination number of a molecule in square close packed layer?
16. Experiment shows that Nickel oxide has the formula  $\text{Ni}_{0.96}\text{O}_{1.00}$ . What fraction of Nickel exists as of  $\text{Ni}^{2+}$  and  $\text{Ni}^{3+}$  ions?
17. What is meant by the term "coordination number"? What is the coordination number of atoms in a bcc structure?
18. Write a note on Frenkel defect.

#### UNIT-7

1. Define average rate and instantaneous rate.
2. Define rate law and rate constant.
3. Derive integrated rate law for a zero order reaction.  $\text{A} \rightarrow \text{product}$ .
4. Define half life of a reaction. Show that for a first order reaction half life is independent of initial concentration.
5. What is an elementary reaction? Give the differences between order and molecularity of a reaction.
6. Explain the rate determining step with an example.
7. Describe the graphical representation of first order reaction.
8. 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  $\text{Br}_2$ .
9. Explain the effect of catalyst on reaction rate with an example.
10. The rate law for a reaction of A, B and C has been found to be  $\text{rate} = k [\text{A}]^2 [\text{B}][\text{L}]^{3/2}$ . How would the rate of reaction change when
  - (i) Concentration of [L] is quadrupled
  - (ii) Concentration of both [A] and [B] are doubled
  - (iii) Concentration of [A] is halved
  - (iv) Concentration of [A] is reduced to  $(1/3)$  and concentration of [L] is quadrupled.
11. Explain briefly the collision theory of bimolecular reactions.
12. Write Arrhenius equation and explains the terms involved.
13. Explain pseudo first order reaction with an example.
14. How do concentrations of the reactant influence the rate of reaction?

15. How do nature of the reactant influence rate of reaction?
16. The rate constant for a first order reaction is  $1.54 \times 10^{-1}$ . Calculate its half life time.

#### UNIT-8

1. What are lewis acids and bases? Give two examples for each.
2. Discuss the Lowry – Bronsted concept of acids and bases.
3. Identify the conjugate acid base pair for the following reaction in aqueous solution
4. Account for the acidic nature of  $\text{HClO}_4$ . In terms of Bronsted – Lowry theory, identify its conjugate base.
5. When aqueous ammonia is added to  $\text{CuSO}_4$  solution, the solution turns deep blue due to the formation of tetramminecopper (II) complex, among  $\text{H}_2\text{O}$  and  $\text{NH}_3$  Which is stronger Lewis base?  $[\text{Cu}(\text{H}_2\text{O})_4]^{2+} + 4\text{NH}_3(\text{aq}) \rightarrow [\text{Cu}(\text{NH}_3)_4]^{2+}(\text{aq})$
6. Define solubility product
7. Define ionic product of water. Give its value at room temperature.
8. Explain common ion effect with an example
9. Derive an expression for Ostwald's dilution law
10. Define pH
11. Derive an expression for the hydrolysis constant and degree of hydrolysis of salt of strong acid and weak base
12. Write the expression for the solubility product of  $\text{Ca}_3(\text{PO}_4)_2$ .
13. Write the expression for the solubility product of  $\text{Hg}_2\text{Cl}_2$ .

#### UNIT-9

1. Define anode and cathode
2. Why does conductivity of a solution decrease on dilution of the solution?
3. State Kohlrausch Law. How is it useful to determine the molar conductivity of weak electrolyte at infinite dilution?
4. Describe the electrolysis of molten  $\text{NaCl}$  using inert electrodes.
5. State Faraday's Laws of electrolysis.
6. Describe the construction of Daniel cell. Write the cell reaction.
7. Why is anode in galvanic cell considered to be negative and cathode positive electrode?
8. Which of 0.1M  $\text{HCl}$  and 0.1 M  $\text{KCl}$  do you expect to have greater and why?
9. Arrange the following solutions in the decreasing order of specific conductance.
  - i) 0.01M  $\text{KCl}$  ii) 0.005M  $\text{KCl}$  iii) 0.1M  $\text{KCl}$  iv) 0.25 M  $\text{KCl}$  v) 0.5 M  $\text{KCl}$
10. Why is AC current used instead of DC in measuring the electrolytic conductance?
11. Two metals  $\text{M}_1$  and  $\text{M}_2$  have reduction potential values of  $-x\text{V}$  and  $+y\text{V}$  respectively. Which will liberate  $\text{H}_2$  and  $\text{H}_2\text{SO}_4$ .
12. Derive an expression for Nernst equation
13. Write a note on sacrificial protection.
14. Explain the function of  $\text{H}_2 - \text{O}_2$  fuel cell.
15. Ionic conductance at infinite dilution of  $\text{Al}^{3+}$  and  $\text{SO}_4^{2-}$

## UNIT-10

1. Give two important characteristics of physisorption
2. Differentiate physisorption and chemisorption
3. In case of chemisorption, why adsorption first increases and then decreases with temperature?
4. Which will be adsorbed more readily on the surface of charcoal and why;  $\text{NH}_3$  or  $\text{CO}_2$  ?
5. Heat of adsorption is greater for chemisorptions than physisorption. Why?
6. Peptising agent is added to convert precipitate into colloidal solution. Explain with an example.
7. What happens when a colloidal sol of  $\text{Fe}(\text{OH})_3$  and  $\text{As}_2\text{O}_3$  are mixed?
8. What is the difference between a sol and a gel?
9. Why are lyophilic colloidal sols are more stable than lyophobic colloidal sol.
10. Addition of Alum purifies water. Why?
11. What are the factors which influence the adsorption of a gas on a solid?
12. What are enzymes? Write a brief note on the mechanism of enzyme catalysis.
13. What do you mean by activity and selectivity of catalyst?
14. Describe some feature of catalysis by Zeolites.
15. Give three uses of emulsions.
16. Why does bleeding stop by rubbing moist alum?
17. Why is desorption important for a substance to act as good catalyst?
18. Comment on the statement: Colloid is not a substance but it is a state of substance.
19. Explain any one method for coagulation.
20. Write a note on electro osmosis.
21. Write a note on catalytic poison.
22. Explain intermediate compound formation theory of catalysis with an example.
23. What is the difference between homogenous and heterogenous catalyst?
24. Describe adsorption theory of catalysis.

## UNIT-11

1. Identify the product (s) is / are formed when 1 – methoxy propane is heated with excess HI. Name the mechanism involved in the reaction
2. Draw the major product formed when 1-ethoxyprop-1-ene is heated with one equivalent of HI.
3. Suggest a suitable reagent to prepare secondary alcohol with identical group using Grignard reagent.
4. What is the major product obtained when two moles of ethyl magnesium bromide is treated with methyl benzoate followed by acid hydrolysis.



5. Predict the major product, when 2-methyl but -2-ene is converted into an alcohol in each of the following methods. (i.) Acid catalysed hydration (ii.) Hydroboration (iii.) Hydroxylation using bayers reagent
6. Arrange the following in the increasing order of their boiling point and give a reason for your ordering (i.) Butan – 2- ol, Butan -1-ol, 2 –methylpropan -2-ol (ii.) Propan -1-ol, propan -1,2,3-triol, propan -1,3 – diol, propan -2-ol
7. Can we use nucelophiles such as  $\text{NH}_3$  ,  $\text{CH}_3\text{O}^-$  for the Nucleophilic substitution of alcohols.
8. Is it possible to oxidise t – butyl alcohol using acidified dichromate to form a carbonyl compound.
9. What happens when 1-phenyl ethanol is treated with acidified  $\text{KMnO}_4$ .
10. Write the mechanism of acid catalysed dehydration of ethanol to give ethane.
11. How is phenol prepared form i) chloro benzene ii) isoprophy benzene
12. Explain Kolbe's reaction.
13. Writes the chemical equation for Williamson synthesis of 2-ethoxy – 2- methyl pentane starting from ethanol and 2 – methyl pentan -2-ol.
14. Write the structure of the aldehyde, carboxylic acid and ester that yield 4-methylpent -2-en-1-ol.
15. What is metamerism? Give the structure and IUPAC name of metamers of 2-methoxy propane
16. How are the following conversions effected i) benzylchloride to benzylalcohol ii) benzyalalcohol to benzoic acid
17. How will you convert acetylene into n-butyl alcohol?

#### UNIT-12

1. How is propanoic acid is prepared starting from (a) an alcohol (b) an alkylhalide (c) an alkene
2. How will you convert benzaldehyde into the following compounds (i) benzophenone (ii) benzoic acid (iii) hydroxy phenyl acetic acid.
3. What is the action of HCN on (i) propanone (ii) 2,4- dicholorobenzaldehyde.
4. Write the structure of the major product of the aldol condensation of benzaldehyde with acetone.
5. How are the following conversion effected (i) propanal into butanone (ii) hex-3-yne into hexan-3-one (iii) phenylmethanal into benzoic acid (iv) phenylmethanal into benzoin

#### UNIT-13

1. Write down the possible isomers of the  $\text{C}_4\text{H}_3\text{NO}_2$  give their IUPAC names.
2. There are two isomers with the formula  $\text{CH}_3\text{NO}_2$  . How will you distinguish between them?
3. What happens when i. 2 – Nitropropane boiled with HCl  
ii. Nitrobenzeneelectrolytic reduction in strongly acidic medium.

- iii. Oxidation of tert – butylamine with  $\text{KMnO}_4$
- iv. Oxidation of acetoneoxime with trifluoroperoxy acetic acid.
4. How will you convert nitrobenzene into i) 1,3,5 – trinitrobenzene ii) o and p-nitrophenol iii) m – nitro aniline iv) azoxybenzene v) hydrozobenzene vi) N – phenylhydroxylamine vii) aniline
5. Write short notes on the following i) Hofmann's bromide reaction ii) Ammonolysis iii) Gabriel phthalimide synthesis iv) Schotten – Baumann reaction v) Carbylamine reaction vi) Mustard oil reaction vii) Coupling reaction viii) Diazotisation ix) Gomberg reaction
6. How will you distinguish between primary, secondary and tertiary aliphatic amines.
7. Account for the following
  - i. Aniline does not undergo Friedel – Crafts reaction
  - ii. Diazonium salts of aromatic amines are more stable than those of aliphatic amines
  - iii.  $\text{pK}_b$  of aniline is more than that of methylamine
  - iv. Gabriel phthalimide synthesis is preferred for synthesising primary amines.
  - v. Ethylamine is soluble in water whereas aniline is not
  - vi. Amines are more basic than amides
  - vii. Although amino group is o – and p – directing in aromatic electrophilic substitution reactions, aniline on nitration gives a substantial amount of m – nitroaniline.
8. How will you prepare propan-1-amine from (i) butane nitrile (ii) propenamide (iii) 1- nitro propane
9. How will you convert diethylamine into (i) N,N-diethylacetamide (ii) N-nitrosodiethylamine

#### UNIT-14

1. What type of linkages hold together monomers of DNA?
2. Give the differences between primary and secondary structure of proteins.
3. Name the Vitamins whose deficiency cause i) rickets ii) scurvy
4. Write the Zwitter ion structure of alanine.
5. Give any three difference between DNA and RNA.
6. Write a short note on peptide bond.
7. Give two difference between Hormones and vitamins.
8. Write a note on denaturation of proteins.
9. What are reducing and non – reducing sugars?
10. Why carbohydrates are generally optically active.
11. Classify the following into monosaccharides, oligosaccharides and polysaccharides. i) Starch ii) fructose iii) sucrose iv) lactose iv) maltose

12. How are vitamins classified.
13. What are hormones? Give examples.
14. Write the structure of all possible dipeptides which can be obtained from glycine and alanine.
15. Define enzymes.
16. Write the structure of  $\alpha$ -D (+) glucopyranose.
17. What are different types of RNA which are found in cell.
18. Write a note on formation of  $\alpha$ -helix .
19. What are the functions of lipids in living organism.
20. Is the following sugar, D – sugar or L – sugar?

## UNIT-15

1. Which chemical is responsible for the antiseptic properties of Dettol.
2. What are antibiotics?
3. Name one substance which can act as both analgesic and antipyretic
4. Write a note on synthetic detergents
5. How do antiseptics differ from disinfectants?
6. What are food preservatives?
7. Why do soaps not work in hard water?
8. What are drugs? How are they classified
9. How do tranquilizers work in body.
10. Write the structural formula of aspirin.
11. Explain the mechanism of cleansing action of soaps and detergents
12. Which sweetening agent is used to prepare sweets for a diabetic patient?
13. What are narcotic and non – narcotic drugs. Give examples
14. What are anti fertility drugs? Give examples.
15. Write a note on co – polymer
16. What are biodegradable polymers? Give examples.
17. How is terylene prepared?
18. Write a note on vulcanization of rubber
19. Classify the following as linear, branched or cross linked polymers a) Bakelite  
b) Nylon c) polythene
20. Differentiate thermoplastic and thermosetting.

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