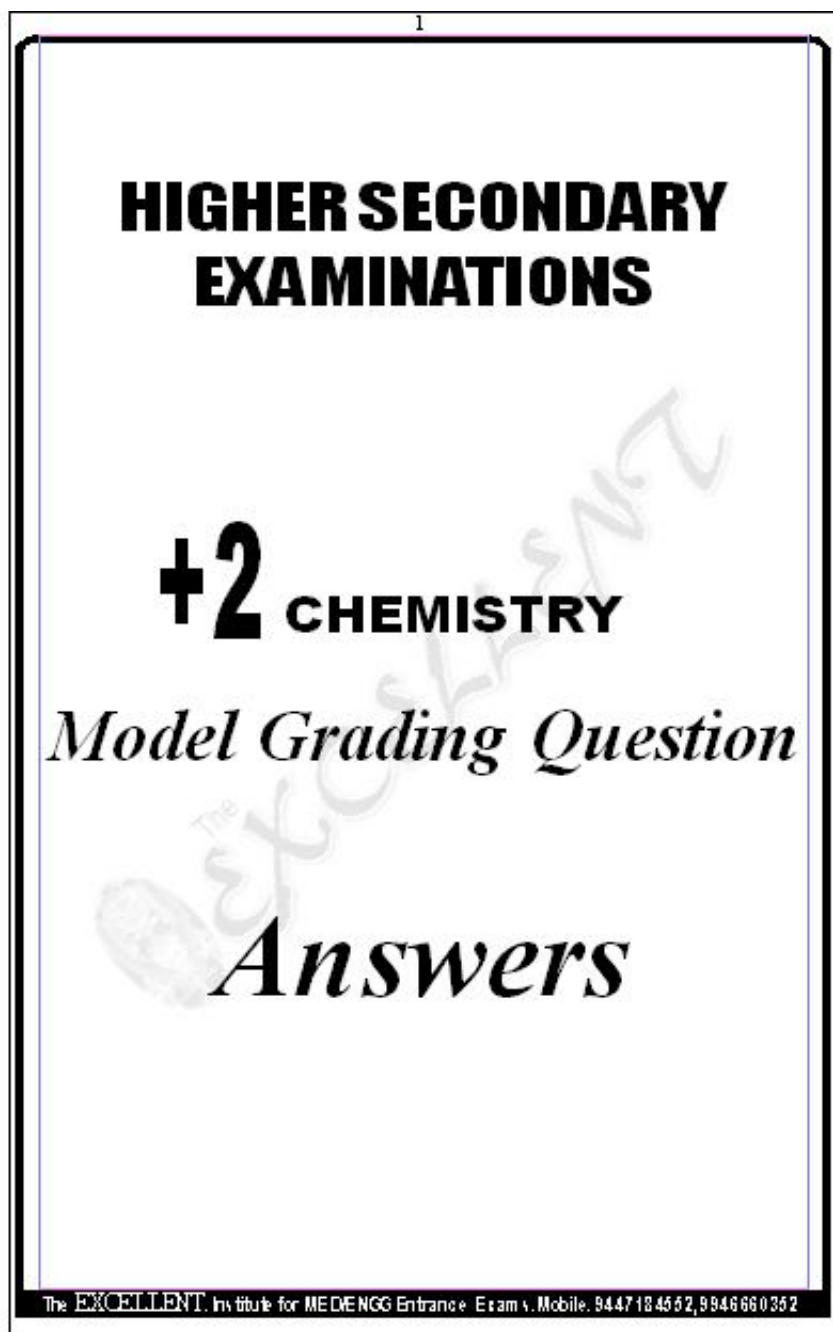


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UNIT 1 SOLID STATE CHEMISTRY

1. 1). The solid is amorphous. Amorphous solids are isotropic

2. $\frac{1}{8}$, 1

$$3 \text{ no: of P atoms} = \frac{1}{8} \times 8 + \frac{1}{2} \times 6 = 4$$

$$\text{no: of Q atoms} = \frac{2 \times 4 \times \frac{2}{3}}{\frac{16}{3}} = \frac{16}{3} \quad \text{Formula} = \frac{P_4 Q_{16}}{3} = P_3 Q_4$$

$$4 \text{ i). } r = \frac{a}{\sqrt{2}} = 0.3535 a \quad a = \frac{r}{0.3535} = 353.6 \text{ pm} \quad \text{ii) } 2.2817 \times 10^{22}$$

5. Increase of P increase co-ordn no: But increase of T decreases co-ordm no:

6. Yes In NaCl, r^+ and r^- are almost same

But in AgCl, r^+ and r^- have a different values

7. Crystalline : KCl, sugar Amorphous : Plastic, Rubber

8. b is correct Because, unit cell is a part of space lattice

9. a) hcp - 12 b) ccp - 12 c) bcc - 8 d) fcc - 12

10. a) Octahedral = N b) tetrahedral = 2N c) factual question

11. a) factual question b) factual question c) factual question

12. F - centres produced make it violet coloured. Metal excess defect due to anionic vacancies.

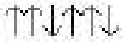
13. i) a - Plastic b - sugar

14. i) The vacant or empty space in a close packed structure is called void.

ii) factual question iii) tetrahedral void - 4 Octahedral void - 6

iv) iv. No.of octahedral voids = n No. of tetrahedral voids = 2n

15. i) Barium titanate is ferro electric But Lead zirconate is antiferro electric

ii) Piezo electricity is the electricity produced on applying mechanical stress on polar crystal. Pyroelectricity is the electricity produced on heating some polar crystals. iii) 

16. Molecular Crystal Molecules vander Waal's forces solid CO₂

Ionic crystal Ions electrostatic forces NaCl

Covalent crystal atoms covalent bond graphite

Metallic crystal Metal ions metallic bond Zinc

17. cubic $a = b = c$ $\alpha = \beta = \gamma = 90^\circ$

tetragonal $a = b \neq c$ $\alpha = \beta = \gamma = 90^\circ$

Hexagonal $a = b \neq c$ $\alpha = \beta = 90^\circ$ $\gamma = 120^\circ$

Rhombohedral $a = b = c$ $\alpha = \beta = \gamma \neq 90^\circ$

18. a) simple cubic, no : of particles = 1 b) body centred cubic, no : of particles = 2

c) face centred cubic, no : of particles = 4

19. Formula of the compound = PQ

20. a) void b) tetrahedral voids and octahedral voids

21. Yes, correct Arrangement is fcc Co-ordination is 6 : 6

No. of units per unit cell is 4

22. a) $d = \frac{ZM}{a^3 N_0}$ b) 5.189 g/cm³

23. a) Schottky defects and Frenkel defect b) factual question

c) Schottky defect decreases density.

No change in density in the case of Frenkel defect

24. a) F - centre b) factual question

25. a) Ferromagnetic b) Antiferromagnetic c) Ferrimagnetic

26. Paramagnetic $\rightarrow O_2$ Diamagnetic $\rightarrow NaCl$

Ferromagnetic $\rightarrow Fe$ Antiferromagnetic $\rightarrow MnO$ Ferrimagnetic $\rightarrow Fe_3O_4$

27. a) by the presence of interstitial cation by an anion vacancy

b) eg : for 1 st type $\rightarrow NaCl$

„ for 2 nd types $\rightarrow ZnO$

UNIT 2 SOLUTIONS CHEMISTRY

1. 0.1436
2. a) molality = 6.6733 molal b) Molarity = 9.2673 molar c) Mole fraction = 0.0327
3. (i) 0.0023 (ii) 1.9439×10^{-4}
4. Le Chatelier's principle. As dissolution is an exothermic process solubility should decrease with increase of temperature.
5. Positive deviation $\Delta V_{\text{mix}} > 0$ - The V.P of such solution is higher than that predicted by Raoult's law

Negative deviation $\Delta V_{\text{mix}} < 0$ - The V.P of such solution is lower than that predicted by Raoult's law

6. factual question
7. a) If they exert the same osmotic pressure b) If its osmotic pressure is higher than that of the solution c) If its osmotic pressure is lower than that of the solution.
8. Pure solvent flows out the solution through SPM. Reverse osmosis is used in the desalination of sea water.
9. A molar mass that is either lower or higher than the expected value is called abnormal molecular mass. This is due to association or dissociation.
10. Azeotropic mixtures are mixtures of two liquids which boil at constant temperature and are distilled unchanged in their composition. Maximum boiling azeotropes and minimum boiling azeotropes.
11. If we compare the equations for Raoult's law and Henry's law can be seen that the partial pressure of volatile compound is directly proportional to its molefraction in solution.
12. Properties depend on the no.of solute particles

4 types a. Lowering of V.P

b. Elevation of B.P

c. Depression of F.P

d. Osmotic pressure

$$i = \frac{\text{Normal molar mass}}{\text{Observed molar mass}} \quad \text{(i) 2 (ii) 2 (iii) 2 (iv) 3 (v) 3}$$

14. 3.2511 g

15. 55629.8 g/ml

UNIT 3 ELECTROCHEMISTRY CHEMISTRY

1. (1) 289500 C (2) 193000 C (3) 0 C

2. 1.82487 g

3. Drycell - Primary Batteries Lead storage cell - Secondary Batteries

4. factual question

5. factual question

6. (a) cell constant is $\frac{l}{a}$

(b) specific conductance = observed conductance cell constant (c) 0.75 cm^{-1}

7. (a) HCl (b) factual question (c) factual question

8. factual question

9. factual question

10. b. The law states that limiting molar conductivity of an electrolyte can be represented as the sum of the individual contributions of the cations and anions of the electrolyte.

11. (i) First law :- The amount of chemical reaction which occur at any electrode during electrolysis by a current is proportional to the quantity of electricity passed through the electrolyte

Second Law :- The amount of different substances liberated by the same quantity of electricity passing through the electrolytic solution are proportional to their chemical equivalent weight. (ii) factual question (iii) 434250 C

12. 150 400 250

13. (a) 27 g aluminium and 324 g silver (b) factual question (Faraday's II nd Law)

(c) 7.5 min

14. (a) SHE (b) factual question (c) factual question

15. factual question

16. factual question

17. (a) $E = E^\circ + \frac{2.303RT}{nF} \log \frac{[Cu^{2+}]}{[Zn^{2+}]}$ (b) 0.895115 V

18. b. Lead storage Battery

UNIT 4 CHEMICAL KINETICS CHEMISTRY

1. (i) 4 times (ii) $\frac{1}{4}$ times

2. $\frac{1}{8}$

3. 60.4939 min

4. Concentration of water is excess. So it can be taken as constant.

5. rate and activation energy are inversely proportional to each other.

6. $t_{1/2} = \frac{0.693}{K}$

7. (a) $\frac{-d[N_2]}{dt} = \frac{+d[NH_3]}{2dt}$ (b) $5 \times 10^{-3} \text{ mol / L/s}$

8. (c) 0.2 mol of A and 0.2 mol of B in a 0.1 L vessel

9. (a) $r = K[H_2O_2][I^-]$ (b) 2

10. (i) a is threshold energy b is activation energy (ii) endothermic

11. (a) K is specific reaction rate. Its unit is $\text{mol}^{-2} \text{L}^2 \text{S}^{-1}$ (b) 3 (c) it becomes 2

12. Zero order - $r = K[NH_3]^0$ First order - S^{-1}

Second order - $\text{mol/L}^2 \text{S}^{-1}$ **Third order** - $2NO + O_2 \rightarrow 2NO_2$

Pseudo first order - hydrolysis of ethyl acetate**Fractional order - $r = k [\text{CH}_3\text{CHO}]^{3/2}$**

$$13. \text{ a. } k = A e^{-E_a/RT} \quad \text{b. } \log \frac{k_2}{k_1} = \frac{E_a}{2.303R} \left[\frac{T_2 - T_1}{T_1 T_2} \right]$$

14. (a) E_a - activation energy (b) -do-15. a. $A \rightarrow$ Reactants $B \rightarrow$ Products

16. factual question

17. a. Order - Sum of the powers of the concentration terms in the rate law Experimental quantity

Molecularity - No. of reacting species simultaneously collide to bring a chemical change Theoretical quantity**b. first order c. Pseudo first order reaction - inversion of cane sugar**

18. (a) factual question (b) order = 1 molecularity = 2

(c) Pseudo first order reactions Acid hydrolysis of cane sugar

19. (a) 2 (b) complex reaction.

UNIT 5 SURFACE CHEMISTRY CHEMISTRY

1. Powdered substances have more surface area

2. factual question

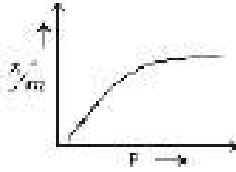
$$3 \text{ (a) Yes (b) } \frac{\uparrow}{\downarrow} \text{ (c) } \frac{\uparrow}{\downarrow}$$

4. The enzyme urease catalyses the hydrolysis of urea only. It does not catalyse hydrolysis of any other amide.

5. ZSM - 5

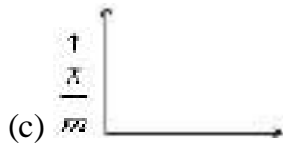
6 (a) adsorbs (b) absorbs (c) in chemisorption

(d) irreversible (e) not specific (f) exothermic process

7. (a) $\frac{x}{m} = K P^{\frac{1}{n}}$ (b) 

(c) P_s is the saturation pressure

8. (a) adsorption isobar (b) chemical adsorption



9. (a) physical adsorption - adsorption of CO_2 on activated charcoal

Chemical adsorption - adsorption of H_2 on Pt.

(b) Physical adsorption \rightarrow force is weak Vanderwaals force

\rightarrow **It is reversible**

Chemical adsorption \rightarrow force is strong chemical bond

\rightarrow **It is irreversible**

c) in catalysis in adsorption indicators

10. (a) adsorption isotherm (b) $\frac{x}{m}$ is the extent of adsorption and P_s , is the saturation pressure no more increase in pressure does not affect the extent of adsorption

11. (a) Lyophilic \rightarrow starch sol, soap sol, gelatin sol

Lyophobic $\rightarrow \text{As}_2\text{S}_3$ sol, $\text{Fe}(\text{OH})_3$ sol, gold sol

(b) They readily Coagulated (need stabilising agent for their preservation)

(c) factual question

12. (a) Purification (b) factual question (c) electro dialysis, hot dialysis



(b) $\text{Fe}(\text{OH})_3$ ppt becomes in colloidal form.

The name of the process is peptisation (c) factual question

14. (a) flocculation or coagulation (b) charge neutralisation

15. (a) Homogenous - Catalyst and reactant are in the same phase

eg : Lead chamber process for the manufacture of H_2SO_4

Heterogenous - Catalyst and reactant are in the different phase.

eg : Contact process

(b) It is the ability to yeild a particular product (c) Zeolites

16. (a) factual question (b) charge neutralisation

17. (a) $\text{NaCl} < \text{MgCl}_2 < \text{Al}_2(\text{SO}_4)_3$ (b) Hardy - Schulze's Rule

18. (i) adsorbent - litmus Adsorbate \rightarrow animal charcoal

(ii) ii. adsorbent - Substance on which adsorption takes place

adsorbate - Substance that get adsorbed on adsorbent (iii) desorption

(iv) if both adsorption and absorption takes place, the process is called as sorption.

19. (i) extent of adsorption increases with increases of pressure of gas.

(ii) A graph of $\frac{x}{m}$ versus pressure at constant temperature. (iii) factual question

20. (i) The path of light in the solution get illuminated by a bluish light.

(ii) The colloidal particles move towards the anode or cathode.

(iii) Tyndall effect and Electro osmosis

21. (i) Microporous 3D aluminosilicates (ii) Selective passage of particles

(iii) to convert alcohol into gasolene-1 , ZSM - 5 is used. (iv) factual question

**UNIT 6 GENERAL PRINCIPLES AND PROCESSES OF ISOLATION OF ELEMENTS
CHEMISTRY**

1. At the point of intersection of Al_2O_3 and MgO curves the ΔG° becomes zero. Below this point Mg can reduce alumina.
2. factual question
3. factual question. The free energy factor - Ellinghalm diagram
4. $2\text{PbS} + 3\text{O}_2 \rightarrow 2\text{PbO} + 2\text{SO}_2$
5. Matte is a mixture contains Cu_2S and FeS. The matte is charged into silica lined convertor and added some silica and hot air blast is blown.
6. gangue - The earthly impurities present along with the ore
Flux - The substance which is added to remove the last traces of gangue during the production of metal .
Slag - The gangue combines with the flux to form an easily fusible substance called as slag.
7. (a) hydrolic washing - Oxide ores. If ore is more denser the gangue.
(b) Froth floatation (c) magnetic separation
8. (a) Cinnabar (b) Magnetic separation (c) Bauxite
9. (a) froth floatation (b) matte - $\text{Cu}_2\text{S and FeS}$ (c) By electrolytic method
10. (a) factual question (b) Lime stone decomposes to give CaO and CO_2 . CaO act as basic flux. (c) factual question
11. (a) Zone refining (b) Van Arkel Process (c) for the purification of Ni
12. (a) Carbon content (b) Bessemer process Open - Hearth process
(c) $\text{Ca}_3(\text{PO}_4)_2$ - Fertilizer
13. (a) cupellation (b) Sn and Pb (c) Zone refining
14. (a) gangue (b) Gravity separation (c) Acidic impurities
15. (a) W (b) Al (c) reduction using electricity
16. (a) Wrought iron contains 0.2 - 0.5 % carbon and traces of phosphorous.
(b) factual question

17. (a) gold (b) Leaching - *MacNor KCN*

18. (i) Aluminium (ii) Cobalt and Magnesium (iii) Au, Ag, Pt

19. (i) Liqutation (ii) Low melting point metals (iii) factual question (iv) factual question

UNIT 7 P-BLOCK ELEMENTS CHEMISTRY

1. Beacuse of the lowest bond dissociation energy of EtH_3

2. Ammonia reacts with Cu^{2+} ion to form blue coloured copperammonium ion $[\text{Cu}(\text{NH}_3)_4]^{2+}$

3. PH_4^+ has on one pair and therefore no lone pair - bond pair repulsion

4. PH_3 or phosphine is formed

5. Low temperature and high pressure

6. $\text{Li}_3\text{N} \rightarrow -3$ $\text{N}_2\text{O}_3 = +3$ $\text{NO} \rightarrow +2$ $\text{NO}_2 = +4$ $\text{N}_2\text{O}_5 = +5$

7. Except CCl_4 , other tetrachlorides are easily hydrolysed by water because the central atom can accommodate the lone pair of electrons from oxygen atom of water molecule in d - orbital.

8. both PCl_3 and PCl_5 reacts with water to form hydrogen chloride gas

9. (a) diagonal relationship (b) Small size, high ionisation energy, non-availability of d- orbitals (c) Both are non metals Both are semiconductors.

10. (a) Presence of H bonding (b) NH_3

(c) Reaction of calciumphosphide with water or dilute HCl.

11. (a) $\text{Xe}_{(g)} + \text{F}_{2(g)} \xrightarrow{\text{673K, 10atm}} \text{XeF}_2$

(b) XeF_2 is hydrolysed to give Xe , HF and O_2 (c) factual question

12. (a) CaOCl_2 dry slaked lime and chlorine gas (b) factual question (c) factual question

13. (a) factual question (b) contains only two replacable H atom (c) factual question

14. (a) because of e^- deficiency (b) factual question

(c) because of H bonding (d) factual question

15. (a) When two different halogens react with each other, interhalogen compounds are formed (b)

ClF , ICl_3 (c) factual question

16. (a) covalent (b) more reactive than halogen (c) factual question (d) not

17. (a) The gas is H_2S (b) factual question (c) factual question

18. Refer text

UNIT 8 THE d AND f BLOCK ELEMENTS CHEMISTRY

1. fully filled d orbitals, weak inter atomic interaction.

2. Mn

3. The removal of one electron alters the relative energies of 4s and 3d orbitals.

4. 0

5. due to pure shielding of 5f electrons than 4f electrons

6. Scandium has incompletely filled d orbital but zinc has no incompletely filled d orbital

7. refer the answer to question no : 5

8. a) They have fully filled d orbitals

b) The most stable oxidised form of copper (Cu^{2+}) has in completely filled d orbitals

c) Scandium Atomic number - 21

9. a) because of the pressure of unpaired d electrons

b) Tl^{3+} has unpaired electron but Sc^{3+} has no c) Co^{2+} and Cr^{2+}

10. a. Chromite ore, NaOH b. It is mixed with H_2SO_4 c. Reaction with KCl

11. a.
$$2\text{CrO}_4^{2-} + 2\text{H}^+ \xrightleftharpoons[\text{orange}]{\text{yellow}} \text{Cr}_2\text{O}_7^{2-} + \text{H}_2\text{O}$$

12. a) Cu^{2+} has incomplete d orbitals but Zn^{2+} has no.

b) because of Lanthanide contraction

c) Sc^{2+} has no incomplete d orbital configuration

d) because of almost same atomic sizes

13. a) Lanthanide contraction b) impure shielding of 4f electrons

c) $\text{La}(\text{OH})_3$ - Lanthanide contraction

14. a) +3 b) to make 4f orbitals fully empty or exactly half filled.

c) Lu^{3+} is $4f^{14}$. f orbital is fully filled. So diamagnetic Tm^{3+} is $4f^{13}$. f orbital contains unpaired electron so paramagnetic

15. a) green coloured b) $[\text{Fe}(\text{H}_2\text{O})_6]^{2+}$ c) green colour is changed to yellow

16. a) in between La and Hf , 14 other elements are there b) Lanthanoides

c) because of lanthanide contraction separation of them become quite difficult

17. a) The no. of unpaired electrons increases upto the middle in every series.

b) Co^{2+} and Cu^{2+} are paramagnetic c) $\mu = 3.87$

18. a) Pure gold is soft, but its alloy is some what hard

b) because of almost similar atomic sizes c) Fe^{2+} is more paramagnetic

19. a) Cu^+ has no unpaired electron but Fe^{2+} has unpaired electron

b) Three unpaired electron c) because of the presence of unpaired electron

20. (i) Zn^{2+} has no unpaired electron Ni^{2+} has

(ii) Cr contains unpaired electrons. So inter atomic attraction is strong. Hg contains no unpaired electron. So inter atomic interaction is weak.

(iii) Mn^{2+} has maximum number of unpaired d electron

21. (i) Yes (ii) a. $\text{K}_2\text{SO}_4 + \text{Cr}_2(\text{SO}_4)_3 + 7\text{H}_2\text{O} + 3\text{Fe}_2(\text{SO}_4)_3$

b. $\text{K}_2\text{SO}_4 + 2\text{MnSO}_4 + 8\text{H}_2\text{O} + 10\text{CO}_2$ (iii) factual question

22. (i) In the lanthanide series, there is a regular decrease in atomic and ionic radii with increasing atomic number. This is known as lanthanide contraction.

(ii) impure shielding of 4f electron

(iii) Lanthanide contraction (iv) Lanthanide contraction

UNIT 9 Co-ordination CompoundS and Organometallics CHEMISTRY

1. $[\text{Co}(\text{NH}_3)_5\text{Cl}]\text{SO}_4$ give white ppt with BaCl_2 solu. and no ppt with AgNO_3 solu.

But $[\text{Co}(\text{NH}_3)_5\text{SO}_4]\text{Cl}$ gives ppt with AgNO_3 and no ppt with BaCl_2 solu.

2. Refer text

3. hybridisation in $[\text{Co}(\text{NH}_3)_6]^{2+}$ is d^2sp^3 and hence it is an inner orbital complex

but hybridisation in $[\text{Ni}(\text{NH}_3)_6]^{2+}$ is sp^3d^2 and hence it is outer orbital complex

4. factual question

5. 4.76×10^{-14}

6. factual question

7. ppt of AgCl is formed is formed

8. hybridisation is sp^3d^2

9. (a) factual question (b) factual question (c) factual question

10. (a) d - d transition haemoglobin $\rightarrow \text{Fe}^{2+}$ Chlorophyll $\rightarrow \text{Mg}^{2+}$

(b) Diamagnetic - absence of unpaired electrons (c) $[\text{Co}(\text{NH}_3)_5\text{NCS}]\text{Cl}_2$

(d) $[\text{Ni}(\text{CO})_4] \rightarrow sp^3 \rightarrow$ hybridisation $[\text{Ni}(\text{CN})_4]^{2-} \rightarrow dsp^2 \rightarrow$ hybridisation

11. (a) factual question (b) P is more stable It is arises due to interchange of ligands between the cation and anion entities.

12. (a) D - penicillamine (b) CN^- is a strong field ligand

(c) $[\text{Cr}(\text{NH}_3)_5(\text{NO}_2)]\text{Cl}_2 \rightarrow \text{red colour}$

$[\text{Cr}(\text{NH}_3)_5(\text{ONO})]\text{Cl}_2 \rightarrow \text{Yellow colour}$

13. (a) Yes (b) factual question (c) factual question

14. (a) factual question

(b) Linkage isomerism Strong field ligands - I^- , Br^- , OH^-

Weak field ligands - NH_3 , CN^-

c) The arrangement of ligands according to the magnitude of crystal field splitting energy is called spectrochemical series.

15. (a) Having more than one donor site. eg: NO_2 , SCN A = $[\text{Cr}(\text{H}_2\text{O})_6]\text{Cl}_3$ B = $[\text{Cr}(\text{H}_2\text{O})_5\text{Cl}]\text{Cl}_2 \cdot 2\text{H}_2\text{O}$

(b) hydrate isomers (c) $[\text{Ni}(\text{NH}_3)_6]\text{Cl}_2 > [\text{Ni}(\text{NH}_3)_5\text{Cl}]\text{Cl}_2 > [\text{Ni}(\text{CO})_4]$

16. (a) $[\text{Cr}(\text{NH}_3)_5\text{Br}]\text{SO}_4$ Pentaammine bromidochromium (III) Sulphate $[\text{Cr}(\text{NH}_3)_5\text{SO}_4]\text{Br}$ Pentaammine sulphate chromium (III) bromide

(b) first one gives white ppt with BaCl_2 solu. and 2 nd one does not

17. (a) factual question (b) factual question (c) factual question

18. (a) When a polydentate ligand is attached to the central metal ion forming a ring structure, the ligand is called chelating ligand. eg: en, EDTA

(b) factual question (c) factual question

19. a. The splitting of the degenerate d - orbital of the metal ion into different set of orbitals having different energy. c. Oxidation no. of the metal Nature of ligand

20.. $[\text{Cr}(\text{NH}_3)_6]^{2+}$ $d^3s^0p^3$ diamagnetic

$[\text{Ni}(\text{CN})_4]^{2-}$ $d^8s^0p^2$ paramagnetic

$[\text{Ni}(\text{CO})_4]$ s^0p^3 diamagnetic

a. Ferrocene, Zeise's salt

b. Wilkinson's catalyst

c. Zeigler - Natta catalyst

UNIT 10 HALOALKANES AND HALOARENES CHEMISTRY

1. $\text{CH}_3 - \text{CH}_2 - \text{CH}_2 - \text{CH}_2 - \text{CH}_2 - \text{Br}$ 1 bromopentane ()

$\begin{array}{cccccc} \text{CH}_3 & - & \text{CH}_2 & - & \text{CH}_2 & - & \text{CH} & - & \text{CH}_3 \\ & & & & & & | & & \\ & & & & & & \text{Br} & & \end{array}$ 2 - bromopentane

$\begin{array}{cccccc} \text{CH}_3 & - & \text{CH}_2 & - & \text{CH} & - & \text{CH}_2 & - & \text{CH}_3 \\ & & & & | & & & & \\ & & & & \text{Br} & & & & \end{array}$ 3 - bromopentane

$\begin{array}{cccc} \text{CH}_3 & - & \text{CH} & - & \text{CH}_2 & - & \text{CH} & \text{Br} \\ & & | & & & & & \\ & & \text{CH}_3 & & & & & \end{array}$ 3 - methyl 1 - bromobutane)

3 - methyl - 2 - bromo butane

2, 2 - dimethyl - 1 - bromopropane)

2 - methyl, 2 - bromo butane

2 - methyl, 1 - bromobutane

||

CH₃ CH₃

2. It act as a dehydrating agent

3. (a) (b)

4.

5. consider the resonating structures

6. (i) (ii)

7. (i) 1 - bromopentane, 2 - bromopentane, 2 - bromo, 2 - methyl butane

(ii) 1 - bromo, 3 - methyl butane, 3 - bromo, 2 methyl butane, 2 - bromo, 2 - methyl butane

8. (i) 1 - butene is formed (ii) phenyl magnesium bromide is formed

9. p - dichlorobenzene is more symmmatric than o - and p - derivatives

Therefore, it fit into the crystal lattice better

UNIT 11 ALCOHOLS, PHENOLS AND ETHERSS CHEMISTRY

1. Reaction with Diborane followed by oxidation with (alkene alcohol)

2. (i) potassium permagnate (ii) anhydrous (iii) Bromine water (iv) alkaline (v) (vi)

3. group is an electron with group

but - group is an electron releasing group

4. H - bonding

5. - OH group is an activating group

6. (a) by the hydration of propene

(b) by the reaction of acetaldehyde with aethymagnesium bromide

20. Dow's process - phenol

Williamson's synthesis - ethers

Fermentation - acetic acid

Iodoform Test - ethyl alcohol

Reimer Tiemann Reaction - salicylaldehyde

Picric acid - 2, 4, 6 - trinitro phenol

UNIT 12 ALDEHYDES, KETONES AND CARBOXYLIC ACIDS CHEMISTRY

1. This is due to their dissociation in aqueous solution to form carboxylate ion and hydronium ions.

2. i. Tollen's Reagent test iii. Action of neutral ferric chloride

iv. Bromiation

3. Factual question

4. Two different aldehydes containing - hydrogen atom undergo condensation.

5. a. Oxidation of ethanol b. Formic acid is more stronger than acetic acid

6. Aldol condensation, Cannizzaro reaction

7.

9. i. Urotropine ii.

III. acetaldehyde ammonia

8. a. By hydration of alkynes b. Tollen's test

10. a. Formalin (40 % soln of formaldehyde) c. Paraldehyde d. Aldol condensation

c.

d.

20. a. Tollens Test, Fehling Test b. Same Reactant and Product , different Reagents.

UNIT 13 AMINES CHEMISTRY

1 Because aryl halides do not undergo nucleophilic substitution with the anion formed by phthalimide.

2. The hydrogen bond in amines are weaker than that in alcohol (Nitrogen is less electronegative than oxygen)

3. Due to the electron releasing effect of alkyl groups.

4. a. Heating with Zn dust

b.

5.

6. a. + effect of alkyl group b. Carbyl amine Test

c.

7. a.

8. a. b. Hofmann's Bromamide reaction c. Carbylamine reaction

9. a. Warming with b. Reduction c. Reaction with

d. Carbyl amine reaction

10. a. 2,4,6 - tribromoaniline b. Sulphanilic acid c. Benzene diazonium chloride

11. a. Hinsberg reagent - Benzene sulphonyl chloride

12. a.

b.

c. Diazotisation followed by azo coupling

13. a. , ,

O-Toluidine m-Toluidine P-Toluidine

b. P-Toluidine

c. O-substituted anilines are normally weak base than aniline.

14. a. Action of

b. c. Synthesis of Sulpha drugs

15. a. Carbylamine reaction b. Reaction with

UNIT 14 BIOMOLECULES CHEMISTRY

1. Essential amino acids amino acids which the human body can't synthesise

Non-essential amino acids amino acids which the human body can synthesise.

2. Fibrous proteins are insoluble in water. Globular proteins are soluble in water.

- 3. nucleoside Base +Sugar nucleotide Base +Sugar+phosphoric acid**
- 4. m-RNA, r-RNA, t-RNA**
- 5. Denaturation of proteins**
- 6. Maltose contains free- CHO group**
- 8. a. All those carbohydrates which reduce fehling's solution and Tollen's reagent are called reducing sugars.**
- b. Reducing sugar contains free-CHO and C=O groups**
- 10. Internal salt of ammino acid is called zwitter ion**
- 11. a. Ascorbic acid b. Retinol c. Testosterone d. Insulin**
- e. Triglyceride f. Lecithin**
- 12. b. Hydrogen bonding c. Sequence in which amino acids are arranged in proteins.**
- 13 a. Amide linkage b. EAA - Valine, Lysine NEAA - Glycine, Alanine**
- 14. a. Adenosine triphosphate which is a nucleotide composed of adenine, ribose and three interlinked phosphate units.**
- 15. a. -D-glucose and -D-glucose**
- b. A pair of stereo isomeric ring forms of a sugar which differ in configuration only around are called anomers.**
- 16. a. The specific rotation gradually falls to + and remains constant at this value.**
- b. Mutarotation c. - glucose is converted in to -D-glucose**
- 17. a. D(+) glucose and D(-) fructose b. Leavo rotation**
- 18. a. Amylose and amylopectin b. Amylose give blue colour with solution.**

19. a. Tryptophan b. Glycine c. Aspartic acid d. Lysine

20. a. i. Amylase ii. Pepsin iii. Maltase

b. High efficiency of Enzymes

c. * Highly specific * High efficiency * They have optimum temperature and

UNIT 15 POLYMERS CHEMISTRY

1. Vulcanised rubber has better elasticity, lower water absorption and better resistance to oxidation.

2. Nylon - 6

Nylon - 6,6

3. Condensation polymerisation

4. Nylon - 6 :- The six indicate that monomer contains six carbon atoms

Nylon - 6,6 The 6,6 indicate each monomer contains six carbon atoms

5. Biodegradable polymers are the polymers which are degraded by micro organisms so that degradation product do not cause serious effects on the environment

eg: PBHV, Nylon - 2 - Nylon -6

6. Homo polymer - formed by the polymerisation of one type of monomer

Co - polymer - Formed by the polymerisation of 2 or more different monomers.

7. a. Bakelite b. Phenol and formaldehyde c. Condensation polymer

d. Cross - linked polymer e. Making combs, formica table tops

8. a. Yes b. Polyethylene, PVC c. PHBV , PLA d. Medical field as surgical goods

9. Nylon 6 Caprolactum

Nylon 6,6 Hexamethylene diamine and adipic acid

10. a. Amylopectin b. Rubber c. Dacron d. Polystyrene e. Melamine formaldehyde resin f. Polyglycolic acid

11. b. c.

For synthetic polymer

For Natural polymer

**12. a. - D glucose b. Tetrafluoro ethylene c. 1,3 butadiene + styrene
d. Phenol + formaldehyde e. Isoprene f. Vinyl chloride**

Homo polymer - Starch , Teflon, Rubber, PVC

Copolymer - Buna - s, Bakelite

13. a. Refer question 1 b. Vulcanization - Charles Good Year c. Isoprene

14. Orlon - Polyacrylonitrile - acrylonitrile

Teflon - Polytetrafluoro ethylene - Tetrafluoroethylene

Terylene - Polyester - Ethylene glycol and Terephthalic acid

Perlon - Nylon -6 - Caprolactam.

UNIT 16 CHEMISTRY IN EVERY DAY LIFE CHEMISTRY

1. Detergents even work with hard water

2. The control of sweetness of food is difficult while using it

3. Emulsification and micelle formation

4. Antipyretics - Paracetamol

Analgesics - Paracetamol

Tranquilizers - Barbituric acid

Antiseptic - Tincture iodine

5. Vehicle + Fixative + Odourous Substance

6. a. Yes b. Paracetamol c. Analgesics

7. a. Chloroquine b. Aspirin c. Barbituric acid d. Dettol

e. 1 % phenol f. Chloram phenicol.

8. a. Antacids b. Remove excess acidity in stomach

9. a. Benzoic acid b. Saccharin

11. b. Merit - work with hard water

Demerit - Non - biodegradable

c. Cationic, anionic and non - ionic detergents

12. A antibiotic which kill or inhibit a wide range of gram +Ve and gram - Ve bacteria.

eg: Penicillin

14. a. They are neurologically active drugs b. Equanil, Veronal