MS JUNIOR COLLEGE

Hyderabad

Important Questions for Final Exam - (2020-21)

CHEMISTRY - II YEAR

Q.No.19 (LAQ)

Chapter 3 : Electro Chemistry

1. State and explain nernst equation with the help of a metallic electrode and a non-electrode. (Pg.58)
2. How is molar conductivity of an aqueous electrolyte solution measured experimentally? (Pg.58)
3. State Kohirausch's law of independent migration of ions. GIve it's applications. (Pg. 75)

Chapter 3-Chemical Kinetics

4. What is "molecularity" of a reaction? How is it differnet from the order of a reaction? Name one bimolecular and one trimolecular gaseous reactions. (Pg.No. 67)
5. Derive an itegrated rate equation for a first order reaction. (Pg.No. 67)
6. What is half-life ($t_{1/2}$) of a reaction? Derive the equations for the half-life value of zero and first order reactions. (Pg.No. 67)
7. Discuss the effect of temperature on the rate of reaction. Derive necessary equations in this context. (Pg.No. 69)
8. Discuss the effect of catalyst on the kinetics of a chemical of reaction with a suitable diagram. (Pg. No. 83)

Q.No.20 (LAQ's)

Chapter 6- p-Block Elements:

9. How is ammonia manufactured by Haber's process? Explain the reactions of ammonia with
   a) $ZnSO_4$(aq) b) $CuSO_4$(aq) c) $AgCl_s$ (Pg. No. 153)
10. How is nitric acid manufactured by Ostwald's Process? How does it react with the following a) Copper
    b) Zn c) S_8 d) P_4 (Pg. No. 154)
11. How is ozone prepared? How does it react with the following? (Pg. No. 160)
    a) PbS b) KI c) Hg d) Ag
12. Explain the structures of (a) BrF_5 and (b) IF_7 (Pg. No. 167)
13. What are interhalogen compounds? Give some examples to illustrate the definition. How are they classified? (Pg. No. 169)
14. How is chlorine prepared in the laboratory? How does it react wtih following? (Pg. No. 170)
    a) Iron b) Hot-conc.NaOH c) Acidified $FeSO_4$ d) Iodine e) H_2S f) $Na_2S_2O_3$
15. How is chlorine prepared by electrolytic method? Explain its eaction with
    a) NaOH and b) NH_3 under different conditions. (Pg. No. 170)
16. Write the names and formulae of the oxoacids of chlorine. Explain their structures and relative acidic nature. (Pg. No. 171)
17. Explain the structures of (a) XeF_4 and (b) $XeOF_4$ (Pg. No. 175)
18. How are XeF_2, and XeF_6 prepared? Explain their reaction with water. Discuss their structures. (Pg. No. 176)

Q.No.21 (LAQ's)

Chapter 11-Halo Alkanes & Halo Arenes

19. Explain S^1_N and S^2_N reactions. (Pg. No. 285)

Chapter 12-Organic compounds Containing C,H,O:

20. Explain the following reactions: (Pg. No. 329)
    a) Willamson's ether synthesis b) Kolbe's reaction
    c) Aldol condensation d) Decarboxylation
21. Explain the following reactions with equations. (Pg. No. 329)
    a) Riemer - Tlemann reaction b) HVZ reaction.

22.Explain the following: (Pg. No. 329)
a) Esterification b) Cannizzaro reaction
23. Explain the following : (Pg. No. 330)
a) Acylation b) Gattermann - Koch Reaction
24. Describe the following - Cross aldol condensation (Pg. No. 323)
25. Explain the following terms. Give an example of the reaction in each caste. (Pg. No. 339)
a) Cyanohydrin b) Acetal c) Semicarbozone d) Aldol
e) Hemiacethal f) Oxime
26. How are the following convention carried in not more than two steps? (Pg. No. 340)
i) Ethanol to 3-hydroxybutanal ii) Bromobenzene to 1-Phenylethanol
iii) Benzaldehyde to ± - Hydroxyphenytocetic acid iv) Benzaldehyde to benzophenone

Chapter 13-Organic compounds Containing Nitrogen :

27. Write a short notes on (a) Carbylamine reaction (b) Racemisation (Pg. No. 360)

SAQ's : (4M)

Chapter : 1 Solid State

1. Calculate the efficiency of packing in case of a metal of body - centered cubic crystal.[Pg. No. 11]
2. Calculate the efficiency of packing in case of face - centered cubic crystal. [Pg. No. 11]
3. Derive Bragg's equation. [Pg. No. 12]

Chapter : 2 Solution

4. A solution of glucose in water is labelled as 10% w/w. What would be the molarity of the solution? [Pg. No. 32]
5. A solution of sucrose in water is labelled as 20% w/w. What would be the mole fraction of each component in the solution. [Pg. No. 32]
6. What is meant by positive deviations from Raoult's law and how is the sign of $\Delta_{mix}H$ related to positive deviation from Raoult's law? [Pg. No. 32]
7. If the osmotic pressure of glucose solution is 1.52 bar at 300 K. What would be its concentration if R = 0.083L bar $mol^{-1}K^{-1}$? [Pg. No. 33]
8. Vapour pressure of water at 293 K is 17.535 mm Hg. Calculate the vapour pressure of the solution at 293 K when 25g of glucose is dissolved in 450g of water. [Pg. No. 33]
9. What is relative lowering of vapour pressure? How is it useful to determine the molar mass of a solute? [Pg. No. 33]
10. Calculate the molarity of a solution containing 5g of NaOH in 450 ml solution. [Pg. No. 34]
11. Define mole fraction and calculate the mole fraction of Ethylene glycol ($C_2H_4O_2$) in a solution containing 20% of $C_2H_4O_2$ by mass. [Pg. No. 35]
12. Define mole fraction. Calculate the mole fraction of H_2SO_4 in a solution containing 98% (w/w) H_2SO_4 by mass. [Pg. No. 35]
13. Define molarity. Calculate the molarity of a solution containing 5g of NaOH in 500 ml of solution. [Pg. No. 35]
14. Define the following : [Pg. No. 35]
a) Relative lowering of vapour pressure b) Elevation of Boilling point
c) Osmotic pressure d) Henry's Law
15. State Raoult's law. Calculate the mass of nonvolatile solute (Molar mass 40 $gr/mole^{-1}$) which should be dissolved in 114 gr of octane to reduce its vapour pressure to 80% [Pg. No. 36].
16. Calculate molality of 2.5 grams of Ethanoic acid? (CH_3COOH) in 75 grams of Benzene. [Pg. No. 36]

Chapter : 4 Surface Chemistry

17. What are different types of adsorption? Give any four differences between characteristics of these different types. [Pg. No. 101]
18. How are colloids classified on the basis of interaction between dispersed phase and dispersion medium? [Pg. No. 103]
19. Define Gold Number. [Pg. No. 105]
20. What are micelles? Discuss the mechanism of micelle formation and cleaning action of soap. [Pg. No. 106]

Chapter : 7 d & f block elements & Coordination Compounds

21. What are interstitial compounds? How are they formed? Give two examples. [Pg. No. 203]
22. Write any four characteristic properties of transition elements. [Pg. No. 203]
23. What is lanthanoid contraction? [Pg. No. 204]
24. Explain Werner's theory of coordination compounds with suitable examples. [Pg. No. 205]
25. Explain the terms (i) Ligand (ii) Coordination number (iii) coordination enfity (iv) Central metal atom/ion. [Pg. No. 206]
26. Write the IUPAC names of the following co-ordination compounds: [Pg. No. 209]
    a) $[Co(NH_3)_4(H_2O)Cl]Cl_2$ b) $[Ni(Co)_4]$
    c) $K_3[Fe(CN)_6]$ d) $[Cr(NH_3)_3(H_2O)_2]Cl_3$
27. Write IUPAC names of the following coordination compounds : [Pg. No. 210]
    a) $[Cu(NH_3)_4SO_4$ b) $K_2[Cr(C_2O_4)_2]$ c) $[Co(SCN)_4]^{-2}$ d) $[PlCl_2(NH_3)_2]$
28. Discuss the nature of bonding and magnetic behaviour in the following co-ordination emitters on the basis of valance bond theory. [Pg. No. 215]
    a) $[Fe(CN)_4]^-$ b) $[FeF_0]^+$ c) $[Co(C_2O_4)_2]^+$ d) $[CoF_4]^+$
29. Sketch the splitting of orbitain in an octahedral crystal field. [Pg. No. 216]

Chapter : 9 Biomolecules :

30. Write a brief note on the structure of glucose. [Pg. No. 242]
31. Explain the structures of DNA and RNA. [Pg. No. 246]

PPQs :

32. Explain wurtz fittig reaction. [Pg. No. 285]
33. How grignard reagent is prepared? [Pg. No. 285]
34. Define the following : [Pg. No. 285]
    (i) Racemic mixture (ii) Enontiomers
35. Write the structures of the following compounds : [Pg. No. 205]
    a) 2-chloro-3-methylpentane b) p-bromo-chlorobenzene
36. What is wurtz reaction? Write an example. [Pg. No. 286]
37. CH_2 - CH_2 - Br $\xrightarrow[\text{dry ether}]{Mg} A \xrightarrow{H_2O} B$. Identify A & B compound. [Pg. No. 286]

PPQs :

38. Arrange the following in decreasing order of their basic strength. [Pg. No. 360]
    $C_6H_5NH_2$, $C_2H_6NH_2$, $(C_2H_5)_2NH$, NH_3.
39. Write short notes on (a) Carbylamine reaction (b) Racemisation [Pg. No. 360]

VSAQ's : (2M)

Chapter : 1 Solid State

1. Why is glass considered super cooled liquid? [Pg. No. 5]
2. Distinguish between
   (i) Hexogonal and monoclinic unit cells (ii) Face-centered and end-centered unit cells [Pg. No. 6]
3. What makes a glass different from quartz? [Pg. No. 8]
4. What is the coordination number of atoms in a cubic closs-pack structures? [Pg. No. 8]
5. How many lattice points are there in one unit cell of face-centered cubic lattice? [Pg. No. 9]
6. What is Schottky defect? [Pg. No. 9]
7. What is Frenkel defect? [Pg. No. 9]
8. What is interstitial defect? [Pg. No. 10]
9. What are f-centers? [Pg. No. 10]

Chapter : 2 Solutions

10. State Raoult's law? [Pg. No. 29]
11. What is Cryoscopic constant? [Pg. No. 29]
12. What are isotonic solution? [Pg. No. 30]
13. Calculate the mass percentage of aspirin ($C_9H_8O_4$ in acetonitrile (CH_2CN) when 6.5 gm of $C_9H_8I_4$ is dissolved in 450g of CH_3CN. [Pg. No. 30]
14. Calculate the mole fraction of H_2SO_4 in a solution containing 98% of H_2SO_4 by mass. [Pg. No. 31]

Chapter : 3 Electrochemistry

15. Write the Nernst equation for the EMF of the cell. [Pg. No. 55]
16. How is E^0 cell related mathematically to the equilibrium constant K_c of the cell reaction? [Pg. No. 55]
17. How is Gibbs energy (G) related to the cell emf (E) mathematically? [Pg. No. 56]

Chapter : 3 Chemical Kinetics :

18. Define the speed or rate of a reaction? [Pg. No. 63]
19. Write the equation for the reate of reaction $5Br^-_{(aq)} + BrO^-_{3(aq)} + 6H^+_{(aq)} \rightarrow 3Br_{2(aq)} + 3H_2O_{(\ell)}$? [Pg. No. 63]
20. Give the units of rate sonstants for zero, first order and second order reactions, [Pg. No. 64]
21. Give two examples for zero order reactions. [Pg. No. 65]
22. What is half-life of a reaction? Illustrate your anwer with an example. [Pg. No. 65]
23. What are pseudo first order reactions? Give one example.
24. A reaction has a half-life of 10 minutes. Calculate the rate constant for the first order reaction. [Pg. No. 69]

Chapter : 4 Surface Chemistry:

25. What are the factors which influence the adsorption of a gas on a solid? [Pg. No. 92]
26. Why is adsorption always exothemic? [Pg. No. 92]
27. Give the signs of ΔH & ΔS, when ammonia gas gets adsorbed on charcoal? [Pg. No. 92]
28. How is adsorption of a gas realted to its critical temperature? [Pg. No. 93]
29. What is an adsorption isotherm? Write the equation of Freundlich adsorption isotherm. [Pg. No. 93]
30. Name the dispersed phase and dispersion medium in the following colloidal systems. [Pg. No. 96]
    a) fog b) smoke c) milk
31. What is critical micelle concentration (CMC) and Kraft temperature (T_k)? [Pg. No. 98]
32. What is dialysis? How is dialysis can be made fast? [Pg. No. 98]
33. What is Tyndall effect? [Pg. No. 98]
34. Sky appears blue in colour. Explain [Pg. No. 98]

35. What is Brownian movement? [Pg. No. 98]
36. What is electrophoresis? [Pg. No. 99]
37. What is electro osmosis? [Pg. No. 99]
38. What is coagulation?
39. Define flocculation value. [Pg. No. 99]
40. State Hardy - Schulze rule? [Pg. No. 99]
41. How is artificial rain produced? [Pg. No. 100]

Chapter : 6 - p-block Elements

42. Nitrogen exists as diatomic molecule and phosphorus as P^{-}_{4}. Why? [Pg. No. 146]
43. Nitrogen molecule is highly stable - Why? [Pg. No. 146]
44. What is inert pair effect? [Pg. No. 147]
45. Ammonia is good complexing agent. explain with an example. [Pg. No. 148]
46. A mixture of Ca_2P_2 and CaC_2 is used in making Holme's Signal - explain. [Pg. No. 148]
47. Why is H_2O a liquid while H_2S is a gas? [Pg. No. 157]
48. H_2O is neutral while H_2S is acidic - explain. [Pg. No. 157]
49. What is failing of mercury? How is it removed? [Pg. No. 157]
50. SO_2 can be used as an anti-chlor. Explain. [Pg. No. 158]
51. How does ozone react with ethylene? [Pg. No. 158]
52. Write the reactions of F_2 and Cl_2 with water. [Pg. No. 163]
53. Electron gain enthalpy of fluorine is less than that of chlorine - explain. [Pg. No. 164]
54. HF is a liquid while HCl is a gas - explain. [Pg. No. 164]
55. Write the formulae of the compounds in which oxygen has positive oxidation states and mention the oxidation states of oxygen in them. [Pg. No. 164]
56. What happen when Cl_2 reacts with dry sloked lime? [Pg. No. 164]
57. How is chlorine manufactured by Deacon's method? [Pg. No. 165]
58. In modern diving apparatus, a mixture of He and O_2 is used - why? [Pg. No. 172]
59. Explain the structure of XeO_3. [Pg. No. 173]
60. Noble gases are inert - explain. [Pg. No. 173]

Chapter : 7 - d & f-block Elements & Coordinator compounds :

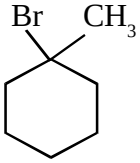
61. Scandium is a transition element. But zinc is not. Why? [Pg. No. 196]
62. Why Zn^{2+} is diamagnetic where as Mn^{2+} is paramognetic? [Pg. No. 198]
63. Calculate spin only magnetic moment of Fe^{+2} ion. [Pg. No. 198]
64. Aqueous Cu^{+2} ions are blue in colour, where as Aqueous Zn^{2+} ions are colourless. Why? [Pg. No. 198]
65. Give two reactions in which transition metals or their compounds acts as catalysis. [Pg. No. 199]
66. What is chelate ligand? Give example? [Pg. No. 201]
67. What is an amidentate ligand? Give example. [Pg. No. 201]
68. $CuSO_4$, $5H_2O$ is blue in colour where as anhydrous $CuSO_4$ is colourless. Why? [Pg. No. 201]

Chapter : 9 - Biomolecules :

69. Why are sugars classified as reducing and non-reducing sugars? [Pg. No. 237]
70. Write two methods of preparation of glucose. [Pg. No. 237]
71. What are anomers? [Pg. No. 238]
72. Define the following as related to proteins. [Pg. No. 240]
    i) Peptide linkage ii) Primary structure iii) Denaturation

Chapter : 11 - Halo Alkanes & Halo Arenes :

73. What are ambident nucleophiles? [Pg. No. 278]
74. What is the stereochemical result of S^1_{11} and S^2_{11} reaction? [Pg. No. 279]
75. Predict the alkenes that would be formed in the following reactions and identify the major alkene. [Pg. No. 280]

i) 

$\xrightarrow[EtOH]{NaOEt}$?

ii) 2 - Chloro - 2 - methylbutane $\xrightarrow[EtOH]{NaOEt}$?

76. How will you carry out the following conversions? [Pg. No. 280]
    i) Ethane to bromoethene ii) Toluene to benzyle alcohol

Chapter : 12 - Organic compounds containing C,H,O :

77. Give the reagents used for the preparation of phenol from chlorobenzene. [Pg. No. 312]
78. Write the equatioins for the following reactions. [Pg. No. 313]
    i) Bromination of phenol to 2,4, 5 - tribromophenol ii) Benzyl alcohol to benzoic acid
79. Give the equations for hte preparation of phenol from Cumene. [Pg. No. 314]
80. Compare the acidic strength of acetic acid, chloroacetic acid, benzoic acid and phenol. [Pg. No. 322]
81. Write the equations of any aldehyde with Fehling's reagent. [Pg. No. 322]
82. What is Tollens reagent? Explain its reaction with Aldehydes. [Pg. No. 322]

Chapter : 13 - Organic compound containing Nitrogen:

83. Gabriel phthalimide synthesis exclusively forms primary amines only. Explain. [Pg. No. 352]
84. Arrange the following bases in decreasing order of pK_b values. [Pg. No. 352]
    $C_2H_5NH_2$, $C_6H_5NHCH_3$, $(C_2H_5)_2$ NH and $C_6H_5NH_2$
85. Write the equations involved in the reaction of Nitrous acid with Ethylamine and aniline. [Pg. No. 357]
86. Explain with equations how methylamine, N, N - dimethylamine and N,N,N-trimethylamine react with benzenesulphonyl chloride and how this reaction is used to separate these amines. [Pg. No. 357]

* * * * * * * * * * * *