



IMPORTANT QUESTIONS - CHEMISTRY SECOND YEAR

I. VERY SHORT ANSWER QUESTIONS (2M)

CH.2 SOLUTION

1. Define mole fraction and calculate mole fraction of H_2SO_4 in a solution containing 98% H_2SO_4 by mass***
2. Calculate weight of glucose required to prepare 500ml of 0.1 M solution**
3. Calculate the molality of 2.5 gm of ethanoic acid (CH_3COOH) in 75g of Benzene ***
4. Define molarity****
5. Define Osmotic pressure *****
6. What are isotonic solutions*****
7. State Raoult's law****
8. State Henry's law ****
9. What is reverse osmosis.give an example ***
10. What is cryoscopic constant**

CH:3 ELECTRO CHEMISTRY AND CHEMICAL KINETICS

11. State Faraday's first law of electrolysis *****
12. What is metallic corrosion .give an example *****
13. What is Galvanic cell. Give example**
14. A reaction has a half life of 10 mins. Calculate the rate constant for first order reaction***
15. Define order and molecularity of reaction. Give example **
16. Give two examples of gaseous first order reaction***
17. Give two examples of zero order reaction**
18. What is rate law .give example*
19. Give units of zero order , first order , second order reaction reactions. **

CH: 5 GENERAL PRINCIPLES OF METALLURGY

20. What is the role of cryolite in the metallurgy of aluminium*****
21. Explain the terms gangue and slag***
22. Write ores with formulae of following metals a) aluminium b) iron ***
23. Give the composition of following alloys a) Brass b) Bronze *****
24. What is Blister of copper. Why is it called*****
25. Write any two ores of following metals a) Al b) Zinc c) Iron d) copper **
26. Give two uses of each of metals a) Zinc b) copper c) Iron d) Aluminium**
27. What is the role of silica in metallurgy of copper**
28. What is the role of depressant in froth floatation ***
29. What is matte .Give its composition **
30. What is flux. Give example**



CH: 6: P BLOCK ELEMENTS

31. Write any two uses of argon (group 18)****
32. NH_3 forms hydrogen bonds but PH_3 does not .why(group 15)****
33. What is tincture of Iodine .what is its use (group 17)****
34. Write neutral oxides of nitrogen (group 15)**
35. What happens when Cl_2 reacts with dry slaked lime (group 17)**
36. How is XeOF_4 prepared .Describe its shape (group 18)***
37. Write reactions of F_2 and Cl_2 with H_2O (group 17)**
38. PH_3 has low boiling point than NH_3 (group 15)**
39. Why nitrogen exists as diatomic molecule N_2 and phosphorous as P_4 .(group 15)****
40. What is Tailing of mercury .How is it removed (group 16)***
41. Nitrogen molecule is highly stable .why**
42. Ammonia is good complexing agent . give example **
43. What is allotropy. Explain different allotropic forms of phosphorous**
44. What happens when Cl_2 reacts with dry slaked lime ****
45. List out the uses of Neon.**
46. Nobel gases are inert . explain **.
47. In modern diving apparatus a mixture of helium and O_2 is used. Why **
48. Why H_2O is liquid while H_2S is gas**

CH. 7 d and f BLOCK ELEMENTS AND COORDINATION COMPOUNDS

49. Write spin formulae to calculate the magnetic moment of transition metal ions****
50. Calculate the spin only magnetic moment of Fe^{2+} ions. ****
51. What is lanthanoid contraction****
52. What is a ligand .give example of unidentate ligand**
53. Give two reactions in which transition metals acts as catalyst***
54. Why Zn^{2+} is diamagnetic and Mn^{2+} is paramagnetic***
55. Aqueous Cu^{2+} ions blue in colour where as aqueous Zn^{2+} ions are colour less .why ****
56. What are transition elements .give example***
57. Scandium is a transition element . But zinc is not. Why****
58. Write the electronic configuration of chromium and copper***
59. What is meant by disproportionation reaction. Give example **
60. $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$ is blue in colour where as anhydrous CuSO_4 is colourless .why***

CH:8: POLYMERS

61. What is PHBV. How is it useful to man*****
62. What is Ziegler Natta catalyst.*****
63. What is addition polymer. Give example****
64. What are polymers. Give example**
65. What is vulcanisation of rubber *****
66. write the monomers of a) Bakelite b) Nylon 6,6**



67. What are copolymers give example ***
68. What is PDI *****
69. Write the monomers of Buna -S and Buna N*****
70. What are the monomers of Nylon -2- Nylon-6 **
71. What are the repeating monomeric units of Nylon -6 and nylon 6,6 ***
72. What are fibres .Give example**
73. What are thermosetting polymers. Give example**
74. What are thermoplastic polymers Give example **
75. What are condensation polymers. Give example **

CH: 10: CHEMISTRY IN EVERY DAY LIFE

76. what are non narcotic analgesics . Give example***
77. What are Tranquilizers Give example***
78. What are food Preservatives ***
79. What are antacid. Give example *****
80. What are antihistamines .example*****
81. What is tincture of iodine .What is its use*****
82. What are antifertility drugs .give example***
83. Why do soaps not work in hard water***
84. What are synthetic deterdents **
85. What is difference between soap and synthetic detergent *

ORGANIC CHEMISTRY C.11-Halo alkanes

86. What is stereochemical result of SN^1 and SN^2 reactions. ***
87. What are Enantiomers.*****
88. What are ambident Nucleophiles*****
89. Write structures of following compounds
 - a) 2-chloro-3-methyl pentane
 - b) 1-bromo-4-sec-butyl 2-methylbenzene
90. Define Racemic mixture *****
91. Write possible chain isomers of compound having molecular formula C_4H_9Br ***
92. What is wurtz reaction. Write an example***

C-13 Organic compounds containing Nitrogen

93. Write Équations for carbyl amine reaction of any one aliphatic amine *****
94. Write IUPAC names of compounds and classify them in to primary Secondary, tertiary amines. $(CH_3)_3CNH_2$, $CH_3(CH_2)_2NH_2$, $(CH_3CH_2)_2NCH_3$ *****
95. Arrange the following in decreasing of their strength
 - $C_6H_5NH_2$, $C_2H_5NH_2$, $(C_2H_5)_2NH$, NH_3 *****
96. Explain reaction of aniline with nitrous acid.**
97. Give structures of A and B $C_6H_5N_2Cl \rightarrow CuCN \rightarrow (A) \rightarrow H_2O \rightarrow (B)$ ****



98. Explain Gattermann reaction.***

99. How Grignard reagent is prepared*****

100. How aniline is obtained from nitrobenzene

$\text{CH}_3\text{CH}_2\text{Br} \rightarrow \text{mg/dry ether} \rightarrow \text{A} \rightarrow \text{H}_2\text{O} \rightarrow \text{B}$. Identify the A and B

Identify the A and B*****

II SHORT ANSWER QUESTIONS (4M)

CH:1 SOLID STATE

1. Derive Braggs equation.*****

2. Write a short note on Schottky defect and Frenkel defect***

CH:2 SOLUTIONS

3. Vapour pressure of water is 7.535 mm of Hg. Calculate the vapour pressure of solvent at 29K. When 25g of glucose is dissolved in 450g of H₂O. ****

4. A solution of glucose in water is labelled as 10%. What would be the molarity.***

5. Define molarity. Calculate the molarity of a solution containing 5g of NaOH in 450ml solution.*****

6. Define mole fraction. Calculate the mole fraction of H₂SO₄ in a solution containing 98% of H₂SO₄ by mass.*****

7. State Raoult's law. Calculate the mass of non-volatile solute (molar mass 40g/mol) which should be dissolved in 114g of octane to reduce its vapour pressure to 80% ***

8. Why is relative lowering of vapour pressure. How is it useful to determine the molar mass of solute ***

CH:4. SURFACE CHEMISTRY

9. What are lyophilic and lyophobic sols. Compare the two terms in stability and reversibility.*****

10. Explain the formation of micelles with a neat sketch.*****

11. What are different types of adsorption. Give any four differences between characteristic of these different types. (or) write any four differences between physisorption and chemisorption*****

12. What is catalysis. How is catalysis classified. Give two examples of each****

13. What are emulsions. How are they classified. Give one example each.***



CH:5. GENERAL PRINCIPLES OF METALLURGY

14. Explain the extraction of zinc from Zinc blend *****
15. Explain purification of sulphide ore by froth floatation*****
16. Explain roasting and calcination*****
17. Explain the extraction of aluminium from bauxite**

CH:6. P BLOCK ELEMENTS

18. What is tailing of mercury. How is it removed. **Group 16** **
19. How is chlorine manufactured by Deacons method.**Group17** **
20. Explain the preparation and structures of XeF₂ and XeF₄. **Group18** *****
21. How is nitric acid manufactured by ostwalds process **Group 15****
22. Explain structures of XeF₆ and XeOF₄.*****
23. What are interhalogen compounds .give some examples and classification.**

CH:7. d and f block elements and coordination compounds

24. Explain the terms a)Ligand b) co-ordination number c) coordination entity
d) central metal atom*****
25. Explain Werner theory of coordination compounds with suitable examples *****
26. Write characteristic properties of transition elements*****
27. Write formulae of following co-ordination compounds*****
 - a) Tetra amine aquachloro cobalt(III)chloride.
 - b) Potassium tetrahydroxo zincate(II)ions
 - c) Potassium trioxato aluminate(III) d) Tetra carbonyl nickel (0).
28. Using IUPAC norms Write formulae of following co-ordination compounds *****
 - a) Hexa amine cobalt (III) chloride b) Diamine chloro(methylamine)platinum (II) chloride
 - c) Hexaaqua titanium(III) ion d)Tetrachlorido nickelate(II) ion
29. Using IUPAC norms Write formulae of following co-ordination compounds *****
 - a) Tetra hydroxo zincate (II)ions b) Hexaamine cobalt (III)sulphate
 - c) Potassium tetrachloro palladate(II) d) Potassium tri(oxalato)chromate(III)
30. Write IUPAC names of following coordination compound***
 - a) [Co(NH₃)₄(H₂O)Cl]Cl₂ b) Ni(CO)₄ c) K₃[Fe(CN)₆ d) [Cr (NH₃)₃(H₂O)₃]Cl₃



CH: 9: BIOMOLECUELS

31. Give sources of following vitamins and name the diseases caused by their deficiency

a)A b)D c)E d)K *****

32. What are hormones. Give example, *****

a) steroid hormones b) polypeptide hormones c) Aminoacid derivatives

33.a) What is denaturation of proteins ****

b) What are essential aminoacids. Give two examples of non essential amino acids***

34. What is Zwitter ion .Give example**

CH: 10: CHEMISTRY IN EVERY DAY LIFE

35. Write notes on antibiotics ***

36. What are analgesics. How are they classified. Give one example each****

37. Write notes on antiseptics and disinfectants ****

38. Write short notes on Food preservatives b) Artificial sweetening agents*****

CH:11. HALOALKANES

39. Explain the mechanism of nucleophilic bimolecular substitution reaction (SN2) with one example. *****

40. a)What are Eantiomers.****

b)What are ambident nucleophilies ****

c) Racemic mixture****

41. Write structures of the following organic halides ****

a) 1-bromo-4-sec-butyl-2-methyl benzene

b) 2-chloro-1-phenyl butane c) p-bromo chlorobenzene d)4-t-butyl -3-iodoheptane

CH: 13. ORGANIC COMPOUNDS CONTAINING NITROGEN

42. Write IUPAC names of following compounds****

a) $\text{NH}_2\text{-CH}_2\text{-CH=CH}_2$ b) $(\text{C}_2\text{H}_5)_2\text{-N-CH}_2\text{-CH}_2\text{-CH}_2\text{-CH}_3$

c) $\text{C}_6\text{H}_5\text{BrNH}_2$ d) $\text{C}_6\text{H}_5\text{N}(\text{CH}_3)_2$

43. Write the structures and names of A,B,C,D in the following reactions ***





III. LONG ANSWER QUESTIONS (8M)

CH:3: CHEMICAL KINETICS / ELECTROCHEMISTRY

1. Give a detailed account of collision theory of reaction rates of bimolecular gaseous. Reactions*****
2. a) State and explain Kohlrausch's law of independent migration of ions*****
b) What is molecularity of a reaction How is it different from order of reaction. Name one bimolecular and one trimolecular gaseous reactions.*****
3. a) What are galvanic cell. Explain working of a galvanic cell with a diagram *****
b) What are fuel cells, give the construction of H₂, O₂ fuel cell.*****
4. a) Give different types of batteries and explain the construction and working
b) What is electrolysis. Give Faradays first law of electrolysis***

CH:6 P-BLOCK ELEMENTS

5. How ammonia manufactured by Habers process. Explain the reactions. with (a) ZnSO₄
b) Cu SO₄ c) AgCl . (group 15) *****
6. How is nitric acid is prepared by Ostwalds process. How does it react with a) Cu b) Zn c) S₈ d) P₄ ***
7. How is Ozone prepared from oxygen .Explain its reaction with
a) C₂H₄ b) KI c) Hg d) Pb e) Ag (group 16) *****
8. How is chlorine manufactured by Deacons method. How does it reacts with following a) cold and dil. NaOH. b) Hot and conc NaOH. (group 17)*****
9. 2. How is chlorine prepared in the laboratory. How does it react with a) Iron b) hot. conc NaOH c) Iodine d) H₂S e) Na₂S₂O₃ f) NH₃ (group 17)*****
10. Write important reactions involved in manufacture of sulphuric acid by contact process (group 16)***

CH:11,12,13: ORGANIC CHEMISTRY

11. Write a suitable example with equations *****
a) Kolbes reaction b) Williamsons ether synthesis
c) Decarboxylation d) Reimer Tiemann reaction
12. Describe a) acetylation b) Cannizaro reaction c) aldol condensation
d) Esterification *****
13. Explain the following reactions *****
a) Hell volhard Zelinsky reaction (HVZ) b) acylation
c) cross aldol condensation d) Gattermann-Koch reaction
14. a) Explain preparation of phenol from cumene **

.....ALL THE BEST.....