QUARTERLY EXAM 2023-2024

12 CHEMISTRY COLLECTION OF QUESTIONS UNIT WISE 2&3 MARK

1.METALLURGY

1.Differentiate between minerals and ore.(B/B-1) ****
2. What is the role of limestone in the extraction of iron from its oxide Fe_2O_3 ? (B/B-3)
3.Explain the principle of electrolytic refining with an example.(B/B-14)
4. Give the basis requirement for vapour phase refining(B/B-12) ****
5. Give the limitation of elingham diagram. (B/B-16) ****
6. Explain zone refining process with an example (In. P.NO:16)
7. Explain about cynide leaching .(In.P.NO:4)
8.What is auto reduction ?(In.P.NO:10) ****
9. Write notes on calcination with an example. (In.P.NO:7) ****
10. Explain refining of i) titanium by van-arkel method ii) nickel by mond's process. (In.P.NO:16,17) ****
11.What are the main observation of Elingham diagram? (In.P.NO-12) ****
12. Explain concentration by magnetic separation with diagram. (In.P.NO-6) ****
13.Describe the underlying principle of froth floatation process.(B/B-4) ****
14.Describe the method for refining of nickel.(B/B-6)
15.Define the following terms i)Roasting ii)Calcination (In.p.no:6,7) ****
16.Mention any two uses of zinc(B/B-9).
17.Explain the terms with suitable example. a)Gangue b)Slage (B/B-11)
18.Give the Electrochemical principle of metallurgy?

2.P-BLOCK -I

1.write a short note on anamolous properties of the first elements of each group of p-block
2.Write the uses of silicones. (B/B-8) ****
3.Write a note on zeolites.write its general formula ? (B/B-16)
4.Draw the structure of CO and CO_2 (B/B-7) ****
5.How will you identify borate radical ? (B/B-15) ****
6.Complete the following reaction (B/B-14)
i) $H_2B_4O_7$? ii) $SiCl_4 + NH_3 \rightarrow$?
7. Give any two uses of borax. (B/B-4) ****
8.How will you convert boric acid into boron nitride. (B/B-17)
9.Write a short note on hydroboration. (B/B-11) ****
10. How is diborne prepared ? (In.P.NO-36) ****
11.How is borax extracted from colemanite ? (In.P.NO-33) ****
12. Write the preparation of potash alum. (In.P.NO-40) ****
13.Mention the uses of potash alum. (In.P.NO-40) ****
14 . Draw the structure of inorganic benzene and diborane .IN.P.NO :37 ****
15.How will silicate classified ? Give an example for each type of silicate ?L.NO:2 (In.P.NO-48)
16.What is known as inorganic benzene ? how it is prepared ? (In.P.NO-37) ****

17.Write a note on zeolites. (B/B-16) ****

3.P-BLOCK ELEMENTS-II

1.Why is Flurine more reactive than other halogens ? (B/B-6) ****
2.What are inter halogens compounds ? mention their properties . (B/B-5) ****
3.Give two uses of Helium. (B/B-7)
4. what is inert pair effect ? (B/B-1) ****
5.Two uses of phosphane. IN.P.NO :70****
6.How will you prepare chlorine in the laboratory ? (B/B-10) ****
7. Write the deacon's process for the manufacture of chlorine. (In.P.NO-83)
8.How will you prepare chlorine from bleaching powder ? (In.P.NO-83)
9.Explain the commercial method of preparation of nitric acid ? (In.P.NO-61) ****
10.What type of hybridisation occur in the following compounds ?
a) BrF_5 b) BrF_3
11.Write short notes on holme's signal ? (In.P.NO-70) ****
12.why HF is not stored in glass bottles ? (In.P.NO-88) ****
13.Explain the dehydrating property of sulphuric acid with suitable example (In.P.NO-78) ****
14.Draw the structure for i) H_2SO_4 (In.P.NO-80) ii)HNO_3(In.P.NO-66) iii)H_3PO_4(In.P.NO-72)
15.How is pure phosphine prepared from phosphorous acid ? in.p.no :69
16.What are inter halogens compounds ?.Give example (B/B-5) ****
17.Why fluorine is more reactive than other halogens. (B/B-6) ****
18.Explain the dehydrating property of sulphuric acid (B/B-12) with suitable example. (In.P.NO78) ****
19. Give two uses of Helium and argon. (B/B-7&15)
20.What is the hybridation in $XeOF_2$? Give its structure. (In.P.NO-93)
21.How will you prepare chlorine in the laboratory ? (B/B-10)

4.TRANSITION AND INNER TRANTION ELEMENTS

1.What are the consequences of lanthanides (B/B-9)
2.Compare the properties of lanthanides and actinides. (B/B-17)
3.Transition metals posses high melting points. Why ?(B/B-30)
4.Why is Gd^{3+} ion colourless ? (B/B-6)
5.Which is more stable among Fe^{3+} and Fe^{2+} ? why ? (B/B-15)
6. Explain why compounds of cu^{2+} are coloured but those of Zn^{2+} are colourless. (B/B-7)
7.Out of $Lu(OH)_3$ and $La(OH)_3$ which is more basic and why ? (B/B-21)
8.Write the preparation of $K_2Cr_2O_7$. (B/B-8)
9.What are interstitial compounds ? (B/B-11) How they differ from the properties of its pure metals ? (B/B-11)
10.Describe the variable oxidation state of 3d series elements. (B/B-27)
11.why first ionization enthalpy of chromium is lower than that of zinc ? (B/B-29)
12.Which is a stronger reducing agent Cr^{2+} or Fe^{2+}? (B/B-24)
13.what is zeiglar-Nata catalyst ? in which reaction it is used ? give equation. (In.P.NO-111)

14.Write a short note on chromyl chloride test. (In.P.NO-114)
15. Why transition elements form complexs ? (In.P.NO-112)
16.Mention the new properties that occur in interstitial compounds. (In.P.NO-111)
17. Mention the uses of potassium permanganate. (In.P.NO-118)
18. Calculate the equivalent weight of $KMnO_4$ In the following reactions. (In.P.NO-118)
a) $MnO_4 + 2H_2O + 3e^- \rightarrow MnO_2 + 4OH$ b) $2MnO_4 + 10Fe^{2+} + 16H^+ \rightarrow 2Mn^{2+} + 10Fe^{3+} + 8H_2O$
19. Transiton elements exhibit variable oxidation state . justify your answer. (In.P.NO-106)
20. Justify the position of lanthanide and actinide in the periodic table. (B/B-4)
21. Describe the preparation of $KMnO_4$. (In.P.NO-115)
22.What is lanthanide contraction ? Mention its consequences. (B/B-9)
23.Write the any five difference between Lanthanide and Actinide (B/B-17)
24.Why transition elements shows variable oxidation state? (In.P.NO-106)
25.Explain why Cr^{3+} is strongly reducing while Mn^{3+} is strongly oxidizing. (B/B-18)
26.Calculate the number of unpaired electrons in Ti^{3+}, Mn^{2+} and calculate the spin only magnatic moments?(B/B-12)
27.Describe the preparation of potassium dichromate (B/B-8)
28.Write a short note on chromyl chloride test. (In.P.NO-114)

6.SOLID STATE

1. State Bragg's equation.explain it terms . (In.p.no:184)
2. What are called primitive and non-primitive unit cells ?
3. Calculate the packing efficiency of fcc. (In.p.no:192) ****
4. How are point defect classified ? (In.p.no:193)
5. Define packing efficiency. (In.p.no:187)
6. Classify molecular crystal with an example for each type. (In.P.NO:179) ****
7.Distinguish between hexagonal close packing and cubic close packing . (B/B-6) ****
8.Explain schottky defect . (B/B-9) ****
9.Calculate the number of atoms in a fcc unit cell. (B/B-11) ****
10.Explain briefly seven types of unit cell. (B/B-5)
11.What is meant by coordination number. (B/B-17)
12.Write any three difference between tetrahedral and Octahedral voids. (B/B-7) ****
13.Define unit cell . (B/B-1) ****
14.Explain metal deficiency defect with example. (B/B-10)
15.Write the properties of ionic crystal (B/B-2)
16.Explain 'f' centers with a neat diagram. (In.p.no:194) ****
17.Outline the classification of point defects. (In.p.no:193)
1.Differentiate between crystalline solid and amorphous solid.(B/B-3) ****
11.What is packing efficiency?(In.p.no:187)
12.Define the terms crystal lattice and unit cell. (B/B-1) ****
13.Explain Frenkel defect. (B/B-25) ****
14. Calculate the packing efficiency of fcc. (In.p.no:192) ****
15.The composition of a sample wurtzite is Fe0.93 o1.00 calculate the percentage of ions present in the form of Fe^{3+}.

16.Explain AAAA and ABABA and ABABC type of three dimensional packing with the help of neat diagram?(B/B-12)
17.Sodium metals crystallizes in BCC structure with edge length of the unit cell 4.3 x10^{-8} cm. Calculate the radius of sodium atom. (B/B-24)
18.Aluminium crystalizes in a cubic close packed structure . its metallic radius is 125 pm.calculate the edge length of unit cell. (B/B-19)
19.An atom crystallizes in fcc crystal lattice and has a density of 10 gm^{-3} with unit cell edge length of 100 pm.Calculate the number of atoms present in 1 g of crystal. (B/B-22)
20.Experiment shows that Nickel oxide has the formula $Ni_{0.96}O_{1.00}$. What faction of Nickel exists as of Ni^{2+} and Ni^{3+} ions ? (B/B-16)
21.If NaCl is loped with 10^{-2} mol of strontium chloride , what is the concentration of cation valency. (B/B-20)
22.An atom crystallizes in FCC crystal lattice and has a density of 10gcm^{-3} with unit cell edge length of 100pm.Calculate the number of atoms present in 1 g ofcrystal. (B/B-22)
23.A face centred cubic solid of an element (atom mass 60) has a cube edge of $4A_0$. Calculate its density.(In.p.no:186)
24.Atoms X and Y form BCC crystalline structure. Atom X is present at the corners of the cube and Y is at the centre of the cube . what is the formula of the compound . (B/B-23)
25.Barium has a body centred cubic unit cell with a length of 508 pm along an edge . what is density of barium in g cm^{-1}.. (In.P.NO:185)

7.CHEMICAL KINETICS

1. Write Arrhenius equation and explain the terms involved. (B/B-14) ****
2.Derive integrated rate law for a zero order reaction A · product. (B/B-3)
3.Define average rate and instantaneous rate . (B/B-1)
4.What is elementary reaction ? Give the difference between order and molecularity of a reaction . (B/B-5) ****
5.Explain briefly the collision theory of bimolecular reactions. (B/B-13)
6.Derive integrated rate law for a first order reaction. (B/B-7) ****
7.Give three examples for zero order reaction . (In. P.NO:215) ****
8.Define : rate constant. (B/B-2)
9.Describe the graphical representation of first order reaction. (B/B-7) ****
10.How do nature of the reactant influence rate of reaction. (B/B-22)
11.Define half life of a reaction. (B/B-4)
12. What is pseudo first order reaction? Give an example. (B/B-17) ****
13. What is meant by half life period ? (In. P.NO:215) ****
14. Distinguish between order of a reaction and molecularity of a reaction. (In. P.NO:210) ****
15. What is activation energy ? (In. P.NO:220) ****
16.Derive integrated rate law for a first order reaction A · product. (B/B-7) ****
17. Differentiate rate of reaction and rate constant of the reaction. (In.P.NO:209) ****
18.Calculate the half life period of a zero order reaction. (In.P.NO:216
19.What is zero order reaction ? Derive rate law for zero order reaction? (B/B-3) ****

20.What is pseudo first order reaction? Give an example. (B/B-17) ****

8.IONIC EQUILIBRIUM

1.what is mean by lewis acid and bases ? (B/B-1)
2. What is common ion effect ?. Give an example(B/B-11) ****
3.Define pH (B/B-13)
5.Define solubility product. (B/B-9)
6.Define an expression for Oswald's dilution law (B/B-12) ****
7.Discuss the Lowry –Bronsted concept of acid and bases. (B/B-2)
8.Write the expression for the solubility product of Hg2Cl2. (B/B-24) ****
9.Define ionic product of water . Give its value at room temperature. (B/B-10)
10. Write relation between ionic product and solibility product ? (In. P.NO:25)
12. write the limitations of arhenius concept of acids and bases. (In .p.no:3)
13. what is buffer capacity ? (In. P.NO:18) ****
14. Differentiate Lewis acid and Lewis base. (In. P.NO:5)
15. What is buffer solution ? .Mentions the two type of buffer solution. (In. P.NO:16) ****
16. Derive the Relation between PH and POH (In. P.NO:9)
17. What is salt hydrolysis ? (In. P.NO:21)
18.Define solubility product a compound? (B/B-9) ****
19. What are conjugate acid –base pairs ? give example. (In. P.NO:4)
20. Define ionic product of water. (B/B-10) ****
21.What are the two types of buffer solution ?Give example for each type. (In. P.NO:16)
22.What is buffer index(β) (In. P.NO:18) ****
23. Determination of solubility product from molar solubility. (In. P.NO:26)
24.Explain buffer action of acidic buffer. (In. P.NO:16)

11.HYDROXY COMPOUNDS AND ETHERS

1. write the uses of diethyl ether and glycerol ? (In. P.NO:138 & 122) ****
2.Explain kolbes reaction. (B/B-12) ****
3. what is saponification reaction. (In. P.NO:110) ****
4. How will you convert Glycol into 1,4 Dioxane (In. P.NO:120)
5. Explain Coupling reaction. (In. P.NO:131) ****
6.Write the structure of picric acid and pyrogallol (In. P.NO:129 & 125)
7. How will you prepare ether by Williamson synthesis with mechanism(In. P.NO:135)
8. what are the uses of anisole ? (In. P.NO:139)
9. How will you distinguish 10 , 20 , 30 alcohols by Lucas test. (In. P.NO:111) ****
10. How will you prepared the following using Grignard reagent
   i) t-butyl alcohol ii) allyl alcohol(In. P.NO:110 E/Y)
11. Give any two test to differentiate phenol and alcohol(In. P.NO:131) ****
12. Write a note on autooxidation of ethers(In. P.NO:137)
13. Explain the saytzeff's rule(In. P.NO:116)
14. How the following conversion are effected

i) phenol → salicyladehyde (In. P.NO:130)
ii) phenol → phenolphthalein(In. P.NO:131)
15.Write notes on i) Dow's process(In. P.NO:126) ii) Reimer Tiemann Reaction(In. P.NO:130)
16. Write note Biological oxidation(In. P.NO:118)
ii) mention the uses of phenol(2) (In. P.NO:131)
17. How can you convert phenol into a)Picric acid and (In. P.NO:129) b)Anisole(In. P.NO:128)
18. Short notes on schotten-Baumann reaction. (In. P.NO:127) ****
19. How is phenolphthalein is prepared ? (In. P.NO:131) ****
20.Write note on swern oxidation (In. P.NO:117)and schotten-baumann reaction. (In. P.NO:127)
21.Give four uses of diethyl ether? (In. P.NO:138) ****
22.How will you prepare 2-methyl hexan -2-ol from Grignard reagent?
23.What are the test to differentiate ethanol and phenol? (In. P.NO:131) ****
24. How will you prepared from glycerol to acrolein (In. P.NO:121) ****
25. How the following conversion are effected ****
i) phenol →salicyladehyde (In. P.NO:130)
ii) phenol → phenolphthalein(In. P.NO:131)
iii) phenol →1,4 dioxane (In. P.NO:120)

12.CARBONYL COMPOUNDS AND CARBOXYLIC ACID

1. Account for the reducing nature of formic acid. (In.p.no: 177) ****
2. How does ammonia react with the following (In.p.no: 158,158,159)
i) formaldehyde ii) acetone iii) benzaldehyde ****
3.How will you convert acetaldehyde to (In.p.no: 162,163)
i) crotonaldehyde ii) Cinnamaldehyde. ****
4 .How will you prepare ethanenitrile from Grignard reagent ?
5.How will you prepare Urotropine and its uses ? (In.p.no: 158)
6.Write note on Etard reaction. (In.p.no: 151)
7. How will you prepare benzoic acid using grignard reagent. (In.p.no: 170)
8. What is kolbe's electrolytic decarboxylation reaction. (In.p.no: 175) ****
9. Short notes on Benedict's solution test. (In.p.no: 167) ****
10. Write any one test for aldehyde (In.p.no: 166) ****
11. Formic acid reduces tollen's reagent .but acetic acid not ? why ? justify ? (In.p.no: 177)
12. What is trans esterification? (In.p.no: 185) ****
13. Write about knoevenagal reaction (In.p.no: 165)and
rosenmund reduction? (In.p.no: 151) ****
14. The oxidation of unsymmetrical ketone is governed by which rule? State the rule with suitable examples?(In.p.no :159-B-b)
15. Explain the steps involved in the mechanism of esterification reaction? (In.p.no: 174) ****
16. friedel craft reaction? (In.p.no: 153) ****
17. iii) perkin's reaction (In.p.no: 165) iv) Claisen condensation? (In.p.no: 186) ****
18. Give any three test for carboxylic acid ? (In.p.no: 177) ****
19. Identify the product of following reaction
i) ozonolysis of But-2-ene and but-1-ene (In.p.no: 149)

ii) Dry distillation of i) calcium ethanoate ii) calcium methanoate (In.p.no: 150)
20. Explain the mechanism of cannizaro reaction? (In.p.no: 163) ****
21. Illustrate the reducing property of acetaldehyde with examples. (In.p.no: 166)
22. Write notes on claisen ester condensation reaction. (In.p.no: 186)
23. How is benzoic acid prepared from the following compounds?
1) toluene (In.p.no: 171) 2)benzoic anhydride (In.p.no: 171) 3)carbon di oxide(In.p.no: 170)
24.Name the ester which has the following flavour? (In.p.no: 185)
(1) Banana (2) Pineapple (3)Orange (4) Apricot
25.Why formic acid act as strong reducing agent? Give one equation to show its reducing property. (In.p.no:177) ****
26. i)How will you prepare benzoic acid from toluene? (In.p.no: 171) ii)Write two tests to identify carboxylic acid. (In.p.no: 177) ****
27.Write short note on i) benedict's solution test (In.p.no: 167)
ii) Knoevenagal reaction (In.p.no: 165) ****
28.How will you prepare, i) Acetic anhydride from acetic acid (B/B-16-i)
ii) Ethylacetate from methylacetate (B/B-16-ii) iii) Acetamide from methylcynaide (B/B-16-iii)
iv) malachitegreen from benzaldehyde (B/B-16-viii)
v) Acetophenone from acetylchloride (B/B-16-v)