**ATOMIC STRUCTURE-II**

1. What do you mean Dual nature of matter?
2. Distinguish between waves and particle *(June-2006)*
3. Give two experiments for verification of particle nature
4. Define –Orbital
7. Define-Bond order *(July-2007, Mar-2010)*
8. What is Hybridizations? *(Mar-2009)*
10. What is the essential condition of effective hydrogen bonding? *(Oct-2006, June-2011)*
11. What is the significance of hydrogen bonding?

**PERIODIC CLASSIFICATION-II**

1. The value of Cl-Cl bond distance is 1.98Å, what is the atomic radius of chlorine?
2. The experimental value of d(C-C₁) is 1.76Å, what is the atomic radius of carbon? *(July-2007)*
3. Calculate the effective nuclear charge of K⁺ ion *(Sep-2007)*
4. State the Slater’s rule
5. Why the ionization energy of Be is greater than Li? *(June-2006, June-2011)*
6. Why the ionization energy of Be is greater than B? *(Oct-2006, June-2008)*
7. Why the ionization energy of Flourine is greater than Oxygen? *(Oct-2009)*
8. The electron affinity of Flourine is less than that of Chlorine? *(Mar-2006, June-2009)*
9. What are the disadvantage of Pauling’s scale and Milliken’s scale? *(D.Q, Oct-2008)*
10. How do electro negativity values help to identify the nature of the bond?
11. How do electro negativity values to find the percentage ionic character in polar covalent bond?
12. Compare the ionization energy of nitrogen with Oxygen *(Mar-2007)*
14. Ionisation energy of Neon is grater than that Flourine Give the reason *(Mar-2009, July-2010)*
15. The electron Affinities of beryllium and nitrogen are almost zero-why? *(Mar-2010)*

**P-BLOCK ELEMENTS**

1. What is inert pair effect? *(Mar-2009)*
2. What burnt alum?
4. Write the reaction of Lead with con HCl?
6. Explain the reducing property of H₃PO₃? (July-2006)
8. Explain the laboratory preparation of orthophosphoric acid? (June-2008)
9. H₃PO₄ is a tri basic acid-Explain
10. What happens when H₃PO₄ is heated? (June-2009, Mar-2011)
11. Write a note on etching on Glass (OR)
HF is not stored in glass bottle why? (Mar-2007, Mar-2011)
12. Give any three uses of Flourine?
13. How will you prepare PH₃ in laboratory?
14. Explain the reducing property of PH₃?
15. Give the uses of Helium? (Sep-2007)
16. Give the uses of Neon (D.Q, June-2008)
17. Give the uses of Xenon?
18. Give the uses of Argon?
19. Give the uses of Krypton?
20. Give any three fluorides of Xenon?
22. Explain the oxidizing power of fluorine? (July-2007)
24. Draw the electron dot formula for H₃PO₃ (Mar-2008)
25. What are inter halogen compounds? Give the preparation of any one (Oct-2008)
26. Draw the electron dot formula for i) H₃PO₄ and ii) PCl₅ (Oct-2008, June-2011)

**D-BLOCK ELEMENTS**

1. Why there is a slight variation in the atomic radii from Cr to Cu?
2. Why transition metal ions are colored? (Oct-2009)
3. Zn, Cd, Hg do not form colored ions?
4. Most of the transition metals and their compounds have catalytic activity why?
6. What are ferromagnetic substances? Give example
8. Why do d-block elements form alloys?
10. Explain the action of moist air on copper?

12. What is nichrome? Give its uses

13. What is philosopher’s wool? How it is formed?

14. Explain the reaction of zinc with dilute acids?


17. Write a note on fineness of gold

18. What is purple of cassius? How it is used?

19. What happens when $K_2Cr_2O_7$ is heated? Give the balanced equation

20. $K_2Cr_2O_7$ is powerful oxidizing agent explains. Give two examples (July-2006)

21. What is Blue vitriol? How it is prepared?

22. Explain the reaction of copper sulphate with ammonia?

23. What is Bordeaux mixture? Give its use

24. What is Lunar caustic? How it is prepared?

25. What is the action of heat on $AgNO_3$?

26. What is calamine? How it is prepared?

27. Write a note on chromyl chloride test (Mar-2009)

28. What is ammonical silver nitrate? How does it react with $HCOOH$?

29. Explain the action of heat with $ZnCO_3$?

30. What are uses of $ZnCO_3$?

31. Why $Mn^{3+}$ is more stable than $Mn^{2+}$? (Mar-2006)

32. All the reactions of copper sulphate

33. A substance is found to have magnetic moment of 3.9BM. How many unpaired electron does it contain? (Mar-2006)

34. Explain the electrolytic refining of copper? (July-2007)

35. What is the reaction of copper sulphate with $KCN$? (July-2007)

36. What is the reaction of Zinc on hot solution of $NaOH$? (Oct-2008)

37. Why do $Zn^{2+}$ salts colorless while $Ni^{2+}$ salts are colored? (June-2009)

38. What happens when $KI$ solution is added to an aqueous solution of copper sulphate? (Oct-2009)

NUCLEAR CHEMISTRY

1. What is radioactivity?

2. Define Half life period

3. State radioactive disintegration theory

4. What is binding energy?

5. Give any three differences between nuclear reaction and chemical reaction (Oct-2006)
6. What is Q-value for a nuclear reaction? *(July-2006)*
7. What is spallation reaction?
8. What is nuclear fission reaction? Give example
9. What is nuclear fusion reaction? Give example
10. What is radio carbon dating?
12. What are the significance of radio carbon dating?(Mar-2011)

**ALL THE PROBLEMS IN NUCLEAR CHEMISTRY**

**SOLID STATE-II**

1. What is unit cell?
2. What is Laue diffraction pattern?
4. Explain the four types of crystals?
5. What is point defect?
6. What is metal excess and metal deficiency defect?
8. What is super conducting transition temperature? *(July-2007)*
9. Give the uses of super conductors? *(July-2010)*
12. Calculate the number of CsCl unit in crystal *(Mar-2007)*
14. Write a note on Frenkel defect *(June-2008)*
15. Sketch the following lattice a) simple centered cubic c) Body centered cubic *(March-2009)*

**THERMONDYNAMICS-II**

1. State the Kelvin-Plank’s statement of second law of thermodynamics? *(Mar-2007)*
2. What is Entropy? Give its units? *(Mar-2006)*
3. State Trouton’s law *(June-2009)*
4. H₂ and He₂ do not obey Trouton’s rule-why?
5. When does the entropy increases?
6. Define-Standard entropy
7. Define-Standard free energy
8. What is Gibb’s free energy? *(July-2006)*
9. What types of liquids or substances deviate from Trouton’s rule? (Oct-2006, June-2011)

10. State Clasius state of second law of thermodynamics (July-2007)

11. Mention the entropy state of second law of thermodynamics and mention the unit of entropy also. (Oct-2008)

PROBLEMS BASED ON TROUTON’S RULE

CHEMICAL EQUILIBRIUM-II

1. Why do chemical equilibrium is referred to as dynamic equilibrium?

2. Sate Law of mass action

3. Define-Equilibrium constant (Oct-2009)


5. Define-Degree of dissociation

6. Define reaction Quotient (Sep-2007, June-2008, and July-2010, Mar-2011)

7. Dissociation of PCl5 decreases in the presence of increase in Cl2 why? (Mar-2009, June-2011)

8. What happens when $\Delta n_g=0, \Delta n_g=+ve, \Delta n_g=-ve$ in a gaseous reaction? (July-2007)

9. What is effect of change of pressure on equilibrium? Give example

10. What is effect of change of concentration on equilibrium? Give example

11. What is effect of change of temperature on equilibrium? Give example

12. What is the relationship between equilibrium constant and dissociations constant? Give one example (Mar-2008)

CHEMICAL KINETICS


2. What is first order reaction?

3. Give three characteristics of order of a reaction

4. Write the first order rate constant equation

5. Give three characteristics of first order reaction

6. Give three examples of first order reaction

7. What is half-life period? (D.Q)

8. Show that the half life period of first reaction in independent of initial concentrations of the reactant


10. What is zero order reaction? Give example

11. What is meant by threshold energy?


13. Distinguish between simple and complex reaction (D.Q)


15. What is parallel reaction? Give example (Mar-2007, June-2011)

17. Write the Arrhenius equation and explain the terms (Mar-2007, Mar-2009, June-2011, Mar-2011)
18. What are simple and complex reactions (Sep-2007)
19. What are complex reactions? Give example (Oct-2008)

PROBLEMS BASED ON HALF – LIFE PERIOD

SURFACE CHEMISTRY

1. What is adsorption?
2. What are adsorbent and adsorbate?
3. What are factors affecting adsorption?
4. What is catalysis? Give example
5. What are characteristics of catalyst?
6. Explain the following with examples
   i) Positive catalysis ii) negative catalysis
   iii) Autocatalysis (Oct-2006) iv) induced catalysis
7. What are promoters? Give example (June-2008, Mar-2010, and June-2010)
8. What is catalytic poison? Give example (June-2007)
9. What is active centre?
10. What are lyophilic colloids? Give example
11. What are lyophobic colloids? Give example
12. What is dialysis?
13. What is Brownian movement? Give reason (June-2009)
14. What is Tyndall’s effect? (June-2011)
15. What is Hellhole’s double layer?
16. What is electrophoresis? (Mar-2006)
17. What is electro osmosis (Oct-2008)
18. How is delta formed?
19. Give any four medicinal uses of colloids
20. What is emulsion? What are emulsifying agents? (June-2006)
21. Why does sky appear blue?
23. What is peptisation? Give an example (Mar-2008)
24. What is tanning? (Sep-2007)
25. What is heterogeneous catalysis? Give example (Mar-2008)
26. Give three differences between physical adsorption and chemical adsorption (Oct-2009)
ELECTROCHEMISTRY-I

1. What are semiconductors? Give example
2. Define-Faraday
4. Define-electro chemical equivalent (June-2009)
5. State Ostwald dilution law (Mar-2009)
7. What are buffer solutions? Give examples (June-2010, June-2011)
8. What is equivalent conductance? Give its unit (June-2008)
9. What is molar conductance? Give its unit
11. What do mean ionic product of water?
12. What is cell constant? Give its unit (Mar-2010)
13. Phenolphthalein is not a suitable indicator for the titration of strong acid and week base. Why?
14. Methyl orange is not a suitable for the titration of strong base and week acid why?

ISOMERISM IN ORGANIC CHEMISTRY

1. What is geometrical isomerism? Give example
2. Distinguish between enantiomers and diasteremoers (D.Q, June-2006)
3. Distinguish between raceme mixture and meson structure (Mar-2007)
4. What is asymmetric carbon?
5. What is chirality?
6. What are the conditions for optical activity? (Oct-2007)
7. Give the structure of E-Z isomer of But-2-ene 1, 4 dioic acid
8. Meso tartaric acid is optically inactive-justify your answer (Mar-2006, Oct-2006)
9. What is racemic mixture? Give example (Mar-2008)
10. Trans-isomer is more stable than cis-isomer .Why? (June-2011)

HYROXYDERIVATIVE

1. The boiling point of alcohols is higher than corresponding hydrocarbons-reason out
2. Alcohols are soluble in water where as hydrocarbons are not-account for this
3. How can the consumption of alcohol by a person be detected? (Mar-2006)
4. What happens when alcohols heated to 410K in the presence of ConH₂SO₄?

5. Give the uses of methanol

6. Give the uses of ethanol

7. How will you prepare ethylene glycol from ethylene? (Oct-2009)


9. How will you convert ethylene glycol into ethylene?

10. What happens when ethylene glycol is heated to 773K?

11. Write the reaction of ethylene glycol with ZnCl₂?

12. Write the reaction of ethylene glycol with Con H₃PO₄

13. Write the reaction of ethylene glycol with Con H₂SO₄?

(or) How ethylene glycol is is converted into dioxan? (Mar-2008, Oct-2008)

14. How will you convert ethylene glycol into formic acid?

15. Give the oxidation reaction of ethylene glycol?

16. What is Soapanification reaction?

17. Write the reaction of ethylene glycol with excess of HI?


19. Explain the reaction of glycerol with oxalic acid at 383K?

20. Explain the reaction of glycerol with oxalic acid at 533K? (Or)

How alkyl alcohol is is prepared from glycerol (Sep-2007, June-2008)

21. Give the oxidation of glycerol

22. Explain the synthesis of glycerol from propylene? (D.Q)

23. How will you convert benzyl alcohol into toluene?

24. Give the uses of benzyl alcohol (Oct-2006)

25. Explain the acidic nature of phenol


27. Explain Dow’s process? (July-2007, Mar-2010)


29. Why glycerol is more viscous than ethanol? (July-2006)

30. Phenol is insoluble in Na₂CO₃ but acetic acid is soluble-Give the reason (Mar-2007)

31. How will you convert ethyl alcohol in to diethyl ether? (July-2007)

32. Alcohols cannot be used as a solvent for Grignard reagents. Why? (Mar-2008)

33. Give a chemical test to distinguish between ethanol and methanol (Oct-2008)

34. How will you convert 2-methyl 2-propanol into 2-methyl (Oct-2008)

35. Phenol is soluble in alcohol why? (June-2010)

36. How phenol is identified by dye test? Give equation (June-2011)
CARBONYL COMPOUNDS

1. Explain the isomerism in carbonyl compounds
2. What is Rosenumund’s reduction? (Sep-2007)
   How does formaldehyde react with ammonia? (July-2006)
4. Explain the reaction of ammonia with bezaldehyde
5. How will you acetone into propane?
6. Give the tests for aldehydes (June-2008)
7. Give the polymerization reactions of formaldehyde and acetaldehyde
8. Give the uses of acetaldehyde
9. Give the uses of formaldehyde
10. What is Formalin? Give its use (July-2007)
11. Give the reaction of bezaldehyde with Chlorine in the absence of catalyst
12. Give the reaction of bezaldehyde with Chlorine in the presence of catalyst
13. Give the uses of bezaldehyde
14. Explain the haloform reaction? (Oct-2008)
15. Explain the reaction of two molecules of acetone with dry HCl
16. Explain the reaction of three molecules of acetone with dry HCl?
17. Explain the reaction of acetone with Con.H₂SO₄?
18. How is acetophenone prepared by Fridel -Craft’s reaction? (Mar-2011)