

Section-A

1) Answer the following objective questions.

[24]

- i. How many moles of carbon are present in 60g of glucose?
- ii. What will be the % of carbon by mass in carbon dioxide?
[A] 34.26% [B] 27.27% [C] 12.67% [D] 43.32%
- iii. How many number of maximum electrons have quantum number $n=4$, $m_s = -\frac{1}{2}$ in an atom?
- iv. State the de Broglie equation.
- v. Arrange the given elements in decreasing order of atomic volume Mg, Si, Al, P.
- vi. Write general electronic configuration of outermost shell of d-block elements?
- vii. How many non-bonding electron pairs are present in the valence shell of central atom of ClF_3 ?
- viii. Write the electronic configuration of N_2 molecule according to M.O.T.
- ix. In which molecule the interaction of hydrogen bond is present.
[A] CH_4 [B] HF [C] SiH_4 [D] MgH_2
- x. Calculate the internal energy change for a system which absorb 701 J heat and work done is 349 J.
- xi. Enthalpy of all the elements in their standard state is _____.
[A] 1 [B] 0 [C] < 0 [D] > 0
- xii. Which are the Lewis acids among H_2O , BF_3 , H^+ , NH_4^+ ?
- xiii. What is the oxidation number of S in $\text{H}_2\text{S}_2\text{O}_7$?
- xiv. Write formula of iron(III)sulphate.
- xv. Write conjugate base of HSO_4^- .
- xvi. Write the molecular formula of sodium zincate.
- xvii. Which kind of hydride is NaH ?
- xviii. Write the formula of superoxide ion.
- xix. Write balance chemical equation for reaction between BF_3 and LiAlH_4 .
- xx. Mention the hybridization of Si in SiF_6^{2-} ?
- xxi. Write the number of pi bonds present in acetophenone.
- xxii. Which of the following compound has molecular formula $\text{C}_n\text{H}_{2n}\text{O}_2$?
[A] dialdehyde [B] diketone [C] carboxylic acid [D] diol
- xxiii. Mention the IUPAC name of the compound having molecular formula C_5H_{12} and quaternary carbon.
- xxiv. Which product is obtained at anode on electrolysis of aqueous solution of sodium acetate?

SECTION B

❖ From the given questions, number 2 to 17, answer any 11 questions as per direction.

[Each question is of 2 marks]

[22]

- Calculate the mole fraction of NaOH in 10% w/w aqueous solution. [At. Mass H=1, O=16, Na=23u]
- Write four important points related to subsidiary quantum number.
- “Maximum valence of second period element is four” explain.
- Explain dipole-dipole force of attraction.
- What is meant by extensive and intensive properties?
- SO₂ can act as oxidising and reducing agent both but HNO₃ can act as only oxidising agent only why?
- What is disproportionation reaction? Write disproportion reaction between Cl₂ and OH⁻.
- What is the difference between the hydride compounds of group 14 and 15 elements on the basis of lewis structure?
- Write balance chemical equation for reaction between H₂O₂ and MnO₄⁻ in acidic and basic medium.
- Compare alkali and alkaline earth metals on the basis of ionization enthalpy property.
- Write balance chemical equation for reaction of Al with dilute HCl and aqueous alkali.
- Mention the difference between crystal structure of diamond and graphite.
- (i) Give IUPAC name of CH₃COCH₂CH(OH)CH₃.
(ii) write line structure of 2,3 dimethylbutanal
- Among O₂NCH₂CH₂O⁻ and CH₃CH₂O⁻ which is more stable and why?
- Write equation for conversion: Benzene to m-nitrochlorobenzene.
- On ozonolysis of an alkene compound “A” mixture of ethanal and pentan-3-one is obtained. Then write the structure of compound A and related chemical reaction.

SECTION C

❖ From the given questions number 18 to 29, answer any 8 questions as per direction.

[each question is of 3 marks]

[24]

- $4\text{HCl}_{(\text{aq})} + \text{MnO}_{2(\text{s})} \longrightarrow 2\text{H}_2\text{O}_{(\text{l})} + \text{MnCl}_{2(\text{aq})} + \text{Cl}_{2(\text{g})}$ according to given reaction how many gram of MnO₂ is required to completely react with 25mL 0.5M HCl.
- Work function of Cesium atom is 1.9eV then calculate (i) threshold wavelength and (ii) threshold frequency.
- Explain exception in the values of ionization enthalpy for elements of second period.
- On the basis of VSEPR theory explain
(i) H₂S is not linear.
(ii) why PCl₃ is not planar
- What is the total pressure of the 9 dm³ flask at 27 °C having mixture of 3.2g of CH₄ and 4.4g of CO₂?
- Explain Hess law with example.
- Ionization constant of 0.1M bromo acetic acid is 0.132. Then calculate pH and pKa of this solution.
- Balance the following redox reaction by any method, which is taking place in acidic medium.
 $\text{Cl}_2\text{O}_{7(\text{g})} + \text{H}_2\text{O}_{2(\text{aq})} \longrightarrow \text{ClO}_{2(\text{aq})}^- + \text{O}_{2(\text{g})}$

26. Mention the points, which describe diagonal relationship between lithium and magnesium.
27. Give reason "CCl₄ is insoluble in water while SiCl₄ easily get hydrolysed."
28. Explain position and functional group isomerism with one example of each.
29. Explain method of preparation of ethane and butane from chloroethane with suitable chemical reaction.

SECTION D

❖ From the given questions number 30 to 32, answer any 2 questions as per direction.
[each question is of 5 marks]

[10]

30. Mention the characteristics of hybridization and explain structure of SF₆ on the basis of hybridization.
31. On reaction between propene and HBr 2-bromo propane is obtained while in presence of benzoyl peroxide the same reaction gives 1-bromo propane. Explain with mechanism.
32. If solubility product constant of Ag₂CrO₄ and AgBr are 1.1×10^{-12} and 5×10^{-13} then calculate ratio of the molarity of their saturated solutions.