

**Class : 11**Register  
Number**COMMON HALFYEARLY EXAMINATION 2022 - 23**

Time Allowed : 3.00 Hours]

**CHEMISTRY**

[Max. Marks : 70

**PART - I****I Answer of the following:**

15x1=15

- Which one of the following is used as a standard for atomic mass.  
a)  ${}_{6}\text{C}^{12}$                       b)  ${}_{7}\text{C}^{12}$                       c)  ${}_{6}\text{C}^{13}$                       d)  ${}_{6}\text{C}^{14}$
- The total number of orbitals associated with the principal quantum number  $n = 3$  is  
a) 9                              b) 8                              c) 5                              d) 7
- In a given shell the order of screening effect is  
a)  $s > p > d > f$               b)  $s > p > f > d$               c)  $f > d > p > s$               d)  $f > p > s > d$
- Heavy water is used as  
a) moderator in nuclear reactions                      b) coolant in nuclear reactions  
c) both (a) and (b)    d) none of these
- The radioactive element of group 1 is -----  
a) rubidium                      b) cesium                      c) francium                      d) radium
- The value of the gas constant R is  
a)  $0.082 \text{ dm}^3 \text{ atm}$               b)  $0.987 \text{ cal mol}^{-1} \text{ K}^{-1}$               c)  $8.3 \text{ J mol}^{-1} \text{ K}^{-1}$               d)  $8 \text{ erg mol}^{-1} \text{ K}^{-1}$
- All the naturally occurring processes proceed spontaneously in a direction which leads to  
a) decrease in entropy                                      b) increase in enthalpy  
c) increase in free energy                                      d) decrease in free energy
- Solubility of carbon dioxide gas in cold water can be increased by  
a) increase in pressure                                      b) decrease in pressure  
c) increase in volume                                      d) none of these
- Assertion :** An ideal solution obeys Raoult's Law  
**Reason :** In an ideal solution, solvent-solvent as well as solute-solute interactions are similar to solute-solvent interactions.  
a) both assertion and reason are true and reason is the correct explanation of assertion.  
b) both assertion and reason are true but reason is not the correct explanation of assertion  
c) assertion is true but reason is false                      d) Both assertion and reason are false
- The correct sequence of increasing covalent character is  
a)  $\text{LiCl} < \text{NaCl} < \text{BeCl}_2$                                       b)  $\text{NaCl} < \text{LiCl} < \text{BeCl}_2$   
c)  $\text{BeCl}_2 < \text{LiCl} < \text{NaCl}$                                       d)  $\text{BeCl}_2 < \text{NaCl} < \text{LiCl}$
- In an organic compound, phosphorus is estimated as  
a)  $\text{Mg}_2\text{P}_2\text{O}_7$                       b)  $\text{Mg}_3(\text{PO}_4)_2$                       c)  $\text{H}_3\text{PO}_4$                       d)  $\text{P}_2\text{O}_5$
- The geometrical shape of carbocation is  
a) Linear                              b) tetrahedral                      c) Planer                              d) Pyramidal
- which of the following is optically active  
a) 2 - methyl pentane                                      b) Citric acid                                      c) Glycerol                                      d) None of these
- The name of  $\text{C}_2\text{F}_4\text{Cl}_2$  is -----  
a) Freon - 112                      b) Freon - 113                      c) Freon - 114                      d) Freon - 115
- Which among the following is a green house gas?  
a) CFC                              b)  $\text{CH}_4$                               c)  $\text{O}_3$                               d) All of these

**PART - II****II. Answer any six questions. Question No. 24 is compulsory.**

6x2=12

- Define Avogadro number.
- What are iso electronic ions? Give example.
- What is efflorescence?

K / II / Che / I

19. State the first law of thermodynamics?
20. State Le-Chatelier principle?
21. Why trans-isomer more stable than cis isomer?
22. State Huckel rule?
23. What is acid rain?
24. 12 gram of a non - electrolyte solute dissolved in 75 gram of benzene lowered the freezing point of benzene by 0.20k. The freezing point depression constant of benzene  $5.12 \text{ k kg mole}^{-1}$ . Find the molar mass of the solute.

## PART - III

III Answer any six questions of the following questions. Q. No. 33 is compulsory.

6x3=18

25. Distinguish oxidation and Reduction.
26. Derive De-broglie equation?
27. Discuss the position of hydrogen in the periodic table?
28. Distinguish ideal gas and real gas?
29. Explain the characteristics of Gibb's free energy?
30. List the applications of equilibrium constant?
31. Explain the ionic bond formation in MgO?
32. Define resonance, inductive effect?
33. 0.30 g of a substance gives 0.90 g of carbon dioxide and 0.60 g of water calculate the percentage of carbon and hydrogen in it?

## PART - IV

IV Answer all five questions.

5x5=25

34. (a) (i) Find the oxidation state of oxygen in  $\text{KO}_2$  and  $\text{OF}_2$ .  
(ii) Define and explain Aufbau principle.  
(OR)  
(b) Explain the pauling method of calculating ionic radius?
35. (a) (i) Define diagonal relationship?  
(ii) List the uses of plaster of paris?  
(OR)  
(b) (i) Explain ortho and para hydrogen?  
(ii) Define compressibility factor?
36. (a) Derive the relation between enthalpy and internal energy? (5)  
(OR)  
(b) Derive the relation between  $K_p$  and  $K_c$  for the synthesis of Ammonia? (5)
37. (a) (i) Define Van't Hoff factor?  
(ii) Explain VSEPR theory?  
(OR)  
(b) (i) Write Wurtz - fittig reaction?(2)  
(ii) What is DDT? How will you prepare DDT? (3)
38. (a) Balance the following equation using oxidation number method.  $\text{As}_2\text{S}_3 + \text{HNO}_3 + \text{H}_2\text{O} \rightarrow \text{H}_3\text{AsO}_4 + \text{H}_2\text{SO}_4 + \text{NO}$ .

(OR)

- (b) (i)  $\text{CH}_3 - \text{CH} \equiv \text{CH}_2$   $\xrightarrow{\text{HBr}}$  (A)  
 $\xrightarrow{\text{HBr / Peroxide}}$  (B) Find (A) and (B)
- (ii) Write the IUPAC name of the following compounds?

