

11161  
**CHEMISTRY (New Book)**  
**PART-I**

**NOTE:** There are three sections of this paper. Carefully read the instructions for each section and attempt accordingly. Attempt all questions of Section-A and return it to the Superintendent within given time, even if you have not attempted any question. Select the correct choice and write only A, B, C or D, whichever is appropriate, in the answer box. No marks will be awarded for cutting/erasing or overwriting.

**SECTION-A**

Time: 20 Minutes

Marks: 18

1. A cubic crystal has ..... centre(s) of symmetry. A) one, B) two, C) three, D) six .....  A
2. Activated complex is a substance which is ..... A) stable, B) unstable, C) can be isolated, D) can exist as product .....  B
3. No work is done at constant ..... A) pressure, B) volume, C) mass, D) temperature .....  A
4. Which one has lowest boiling point? A)  $F_2$ , B)  $I_2$ , C)  $Br_2$ , D)  $Cl_2$  .....  C
5. Forward reaction goes virtually to completion when  $K_c$  is ..... A) positive and small, B) positive and large, C) negative and large, D) unity .....  B
6. The oxidation number of Cl in  $HClO_3$  is ..... A) -1, B) +1, C) +3, D) +5 .....  D
7. A ..... has a strong conjugate base. A) weak base, B) strong base, C) weak acid, D) strong acid ...  C
8. Balmer series of spectral lines appear in the ..... portion of spectrum. A) I.R, B) U.V, C) visible, D) x-rays .....  C
9. Species in which the central atom uses  $sp^2$  hybrid orbital in its bonding is ..... A)  $PH_3$ , B)  $NH_3$ , C)  $CH_3^+$ , D)  $SbH_3$  .....  C
10. A cathode has the reduction potential ..... than the anode. A) less, B) greater, C) equal, D) always zero .....  B
11. Freezing point of solution as compared to the solvent is ..... A) higher, B) lower, C) variable, D) remain the same .....  B
12. Lead storage battery is a/an ..... A) Daniell cell, B) voltaic cell, C) dry cell, D) electrolytic cell .....  B
13. the molar volume of the He is  $44.8 \text{ dm}^3$  litre at  $0^\circ\text{C}$  and ..... A) 1 atm, B) 0.5 atm, C) 0.25 atm, D) 2 atm .....  B
14.  $K_b$  is the molal boiling point constant, also called as the ..... constant. A) isotonic, B) ebullioscopic, C) cryoscopic, D) lyophilic .....  B
15. The osmotic pressure of colloidal solution is generally ..... A) small, B) moderately high, C) high, D) zero .....  A
16. In face centered cube each point at the corner is shared by ..... unit cells. A) 2, B) 4, C) 6, D) 8 ....  D
17. The specific rate constant (K) has ..... value for all concentrations of all reactions. A) fixed, B) variable, C) negligible, D) none of these .....  A
18. If 18 grams of glucose is dissolved in 1 kg of water, the molality (m) of glucose solution will be: A) 1.0 m, B) 0.1 m, C) 1.8 m, D) 0.18 m .....  B

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Time: 2 Hours 40 Minutes

**SECTION-B**

Marks: 40

1. Attempt any ten of the following. All carry equal marks.
- i. Prove that  $E = hc\bar{\nu}$
  - ii. Discuss the factors affecting vapour pressure.
  - iii. Write the relationship of  $K_a$  and  $K_b$ .
  - iv. What do you mean by state of a system?
  - v. How will you identify the limiting reagent in a reaction?
  - vi. Calculate the molarity of solution 2.0 g of  $H_2SO_4$  /  $2\text{ dm}^3$  of  $H_2O$
  - vii. Write a note on the significance of MOT.
  - viii. What is polymorphism?
  - ix. Explain standard enthalpy change and heat capacity.
  - x. State and explain law of mass action.
  - xi. Write a short note on Hund's rule.
  - xii. Discuss the factors affecting London dispersion forces.
  - xiii. Derive an expression for buffer solution.

**SECTION-C**

Marks: 27

**NOTE:** Attempt any three of the following questions. All questions carry equal marks.

2.
  - i. Explain the factors that affect the rate of reaction.
  - ii. What is axis of symmetry? Describe with the help of simple diagram.
3.
  - i. Explain the difference between continuous and line spectrum.
  - ii. What is VSEPR theory? Explain it with suitable examples.
4.
  - i. Write a detailed note on liquification of gases.
  - ii. Explain Daniell cell in detail.
5. Write short notes on the following:
  - i. Importance of Liquid Crystals
  - ii. Raoult's Law