

PVG's  
**Muktangan English School & Jr. College, Pune - 9**  
**Preliminary Examination (2024-25)**  
**STD XII**

Subject : Chemistry

Marks - 70

Date : 06.01.2025

Time : - 8.15 - 11.15 am

Instructions :-

1. Use of log table is allowed. Use of calculator is not allowed.
2. Figures to the right indicate full marks
3. The question paper is divided into four sections  
Section A : Each 1 Mark                      Section B : Each 2 Marks  
Section C : Each 3 Marks                      Section D : Each 4 Marks
4. For each multiple choice question it is mandatory to write correct answer along with its alphabets.
5. Physical constant :  $N_A = 6.022 \times 10^{23}$

**Section A**

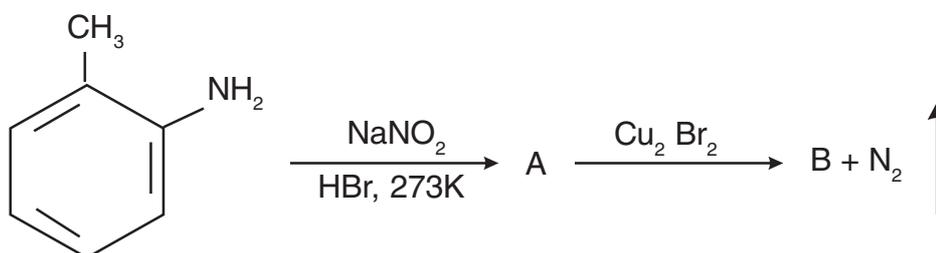
**(10)**

**Q.1 Select and write the correct answer for following multiple choice type of questions.**

- i) Which of the following solution shows positive deviation from Raoult's law?  
a) Phenol & Anilline                      b) Chloroform & Acetone  
c) Ethanol & Acetone                      d) Chloroform & Ethanol
- ii) If Pb has FCC structure with edge length of unit cell 495 pm, then radius of Pb atom is \_\_\_\_\_  
a) 205 pm                                      b) 185 pm  
c) 260 pm                                      d) 175 pm
- iii) Nichrome is an alloy of \_\_\_\_\_  
a) Cu, Sn                                      b) Cu, Ni  
c) Ni, Cr                                      d) Fe, Cr
- iv) Anisole on heating with concentrated HI gives \_\_\_\_\_  
a) Iodobenzene                              b) Phenol & Iodomethane  
c) Iodobenzene & Methanol              d) Phenol & Methanol
- v) Ozonolysis of 2,3-Dimethylbut -2-ene followed by decomposition by Zn dust & water gives \_\_\_\_\_  
a) acetaldehyde                              b) propionaldehyde & acetone  
c) acetone                                      d) acetaldehyde & butyraldehyde



- Q.6** Write reactions involved in the zone of reduction in blast furnace during extraction of iron.
- Q.7** Calculate effective atomic number (EAN) of Cu in  $[\text{Cu}(\text{NH}_3)_4]^{2+}$  (Z of Cu = 29)
- Q.8** What are ambidentate ligands? Explain it with example.
- Q.9** The pH of weak monoacidic base is 11.2, calculate its  $\text{OH}^-$  ion concentration.
- Q.10** Write balanced chemical reactions for the following :
- Chlorobenzene is heated with fuming  $\text{H}_2\text{SO}_4$ .
  - Ethyl bromide is heated with silver acetate.
- Q.11** What are allylic halides? Write one example.
- Q.12** Identify A & B in the following reaction and rewrite the reaction.



- Q.13** Define : Green Chemistry  
Write any two advantages of nanotechnology.
- Q.14** Write balanced chemical reactions to prepare ethanamine from following
- Acetonitrile
  - Nitroethane

### Section C

(24)

Answer any eight of the following.

- Q.15** Define Isotonic solution.  
Derive the formula to determine molar mass of solute from freezing point depression.
- Q.16** Write one example of each acidic buffer and basic buffer.  
Write the relationship between solubility and solubility product for  $\text{Al}(\text{OH})_3$ .
- Q.17** Calculate standard enthalpy of the given reaction
- $$\text{SiO}_{2(s)} + 3\text{C}_{(\text{graphite})} \longrightarrow \text{SiC}_{(s)} + 2\text{CO}_{(g)}$$
- from following reactions?
- $\text{Si}_{(s)} + \text{O}_{2(g)} \longrightarrow \text{SiO}_{2(s)} \quad \Delta_r H^\circ = -911 \text{ kJ}$
  - $2\text{C}_{(\text{graphite})} + \text{O}_{2(g)} \longrightarrow 2\text{CO}_{(g)} \quad \Delta_r H^\circ = -221 \text{ kJ}$
  - $\text{Si}_{(s)} + \text{C}_{(\text{graphite})} \longrightarrow \text{SiC}_{(s)} \quad \Delta_r H^\circ = -65.3 \text{ kJ}$
- Q.18** Draw neat, labelled diagram for Standard Hydrogen Electrode (SHE).  
Write any two functions of salt bridge.

- Q.19** Write the cell reactions in lead storage battery during discharge.
- Q.20** In a first order reaction  $A \longrightarrow \text{product}$ , 80% of the given sample of compound decomposes in 40 minutes. Calculate rate constant of the reaction.
- Q.21** What is the action of concentrated sulphuric acid on the following :
- a) Sulphur                      b) Copper                      c) Carbon
- Q.22** Define Flux.  
Calculate spin only magnetic moment of  $\text{Mn}^{2+}$  ion. (Z of Mn = 25)
- Q.23** Explain formation of  $[\text{Co}(\text{NH}_3)_6]^{3+}$  complex with respect to :
- 1) Hybridisation
  - 2) Magnetic property
  - 3) Geometry
- Q.24** Write IUPAC name of  $\text{C}_6\text{H}_5 - \text{O} - \text{CH}_3$   
Distinguish between  $\text{SN}^1$  and  $\text{SN}^2$  reaction.
- Q.25** Write balanced chemical reactions to prepare following compounds using  $\text{CH}_3\text{MgI}$ .
- a) Ethanol                      b) Propan-2-ol                      c) 2-Methylpropan-2-ol
- Q.26** Write a note on Cannizzaro reaction.  
Write IUPAC name of
- $$\begin{array}{c} \text{O} \quad \text{O} \\ || \quad || \\ \text{CH}_3 - \text{C} - \text{C} - \text{CH}_3 \end{array}$$

### Section D

(12)

Answer any three of the following questions

- Q.27** a) Explain metal deficiency defect with example.  
b) Identify the type of crystalline solid in following  
i) Silver ii) Benzoic acid iii) Diamond iv) NaCl
- Q.28** a) Prove that  $\Delta H = \Delta U + \Delta nRT$   
b) Three moles of an ideal gas expanded isothermally from  $15 \text{ dm}^3$  to  $20 \text{ dm}^3$  at constant external pressure of 1.2 bar. Calculate the amount of work in Joules?
- Q.29** a) Write molecular formulae and structures for following compounds  
i) Chloric acid                      ii) Peroxy disulphuric acid  
b) Explain anomalous behaviour of oxygen in group 16 with respect to  
i) Atomicity                      ii) Magnetic property
- Q.30** a) Write the formula for Triamminetrinitrocobalt(III)  
b) What is the action of following reagents on ethanoic acid?  
i)  $\text{LiAlH}_4$                       ii)  $\text{PCl}_3, \Delta$                       iii)  $\text{P}_2\text{O}_5, \Delta$
- Q.31** a) Write reactions for the formation of nylon-6,6 polymer.  
b) Explain formation of peptide linkage in protein with example.

