# Anjuman Islam Janjira Degree College of Science

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**Affiliated to University of Mumbai**

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| **Class: -S.Y.B.Sc.(G.S)** | **Subject: - Minor Chemistry** |
| **Semester:- III** | **Course code: - 3MN31** |
| **Exam Event:- Winter 2025 (FH)** | **Marks: - 30** |
| **Date: - 14/10/2025** | **Duration: - 1:00 Hours** |

**N.B.**

**1. Figures to the right indicate full marks.**

**2. Draw neat labelled diagrams wherever necessary.**



**Q.1 (A) Select the correct option & complete the sentences (Any Four)** **04**

1. Which is a naturally occurring polymer
   a) Proteins b) PVC c) Polypropylene
2. The process of joining monomers to form a polymer is called:
   a) Hydrogenation b) Polymerisation c) Substitution
3. In addition polymerisation**,** the monomers:
   a) Eliminate small molecules like water
   b) Simply add to each other without loss of atoms c) Rearrange with bond breaking
4. Bakelite and vulcanized rubber are examples of:
   a) Thermoplastic polymers b) Thermosetting polymers c) Linear polymers
5. Cross-linked polymers are usually:
   a) Soft and flexible b) Brittle and infusible c) Easily melted
6. Ostwald viscometer is used to determine:
   A) Weight average molecular weight
   B) Number average molecular weight
   C) Intrinsic viscosity to calculate molar mass

**(B) Attempt any One of the following. (Any One)** **04**

1. Define the following terms i) Monomer ii) repeat unit iii) macromolecule iv) polymerization v) thermosetting polymer
2. Enlist different method of finding molecular weight of polymer. Explain any one in detail

**Q.2 (A) Select the correct option & complete the sentences (Any Three)** **03**

1. Accuracy in analytical chemistry refers to:
   a) Reproducibility of results b) Closeness of a result to the true value
   c) Sensitivity of an instrument
2. Trace analysis is used when the analyte concentration is:
   a) Greater than 10% b) Between 1% and 10% c) Below 0.01%
3. Macro analysis typically involves samples weighing:
   a) Less than 10 mg b) 1–50 mg c) 0.1–1 g
4. Gravimetric analysis is an example of:
   a) Non-instrumental method
   b) Instrumental method c) Chromatographic method
5. The end point in titration is:
   a) Theoretical completion point b) The point where indicator changes color
   c) When pH = 7

**(B) Attempt any One of the following. (Any One)** **04**

1. Define the Sampling? Explain the steps involved in sampling along with its types.
2. What are different types of titration? Explain in any one in detail.

**Q.3 (A) Select the correct option & complete the sentences (Any Four)** **04**

1. In the $H_2$ molecule, both electrons occupy which orbital?
   a. Anti-bonding orbital b. Bonding orbital c. Hybrid orbital
2. What is the effect of repulsive forces when two hydrogen atoms come very close?
   a. Potential energy decreases b. Potential energy remains constant c. Potential energy increases
3. The potential energy diagram of $H_2$ molecule shows:
   a) Maximum at equilibrium bond distance
   b) Minimum at equilibrium bond distance c) Always increasing with distance
4. The structure of tetraborane ($B_4H_{10}$) is:
   a) Planar b) Chain structure with bridging hydrogen atoms
   c) Simple cubic
5. The main use of borax is:
   a) As a reducing agent b) As a flux in metallurgy and in glass making
   c) As a fuel
6. Extrapure silicon is prepared by:
   a) Reduction of silicon dioxide with carbon
   b) Chemical vapor deposition using $SiCl_4$ and hydrogen
   c) Electrolysis of molten $SiO_2$

**(B) Attempt any One of the following. (Any One)** **04**

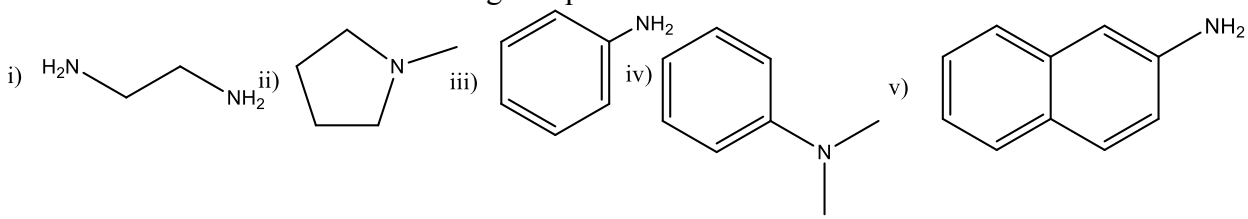
1. Draw and explain the potential energy diagram for the interaction between two hydrogen atom
2. Explain Floating Zone technique for preparation of silicon.

**Q.4 (A) Select the correct option & complete the sentences (Any Three)** **03**

1. Which of the following is a primary amine?
   a) $CH_3NH_2$ b) $(CH_3)_2NH$ c) $(CH_3)_3N$
2. Basicity of aliphatic amines generally:
   a) Decreases with electron-donating substituents
   b) Increases with electron-donating substituents c) Is unaffected by substituents
3. N-alkylation of amines leads to:
   a) Formation of quaternary ammonium salts
   b) Formation of aldehydes c) Formation of carboxylic acids
4. Amines react with nitrous acid to form:
   a) Nitriles b) Diazonium salts c) Nitro compounds
5. Sandmeyer reaction is used for:
   a) Replacing diazonium group with halogens or CN group
   b) Reduction of nitro compounds c) Formation of primary amines

**(B) Attempt any One of the following. (Any One)** **04**

**1.** Give the IUPAC name to the following compound




2. Explain the preparation of diazonium compound with mechanism.