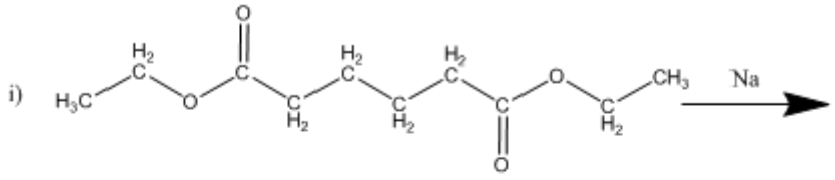
SHRIMATHI DEVKUNVAR NANALAL BHATT VAISHNAV COLLEGE FOR WOMEN
(AUTONOMOUS)
(Affiliated to the University of Madras and Re-accredited with 'A+' Grade by NAAC)
Chromepet, Chennai — 600 044.
B.Sc. END SEMESTER EXAMINATIONS NOVEMBER-2022
SEMESTER - I
20UCHCT1002 - General Chemistry- I

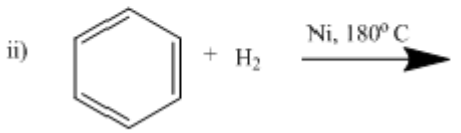
Total Duration : 2 Hrs 30 Mins. Total Marks : 60

Section A

Answer any **SIX** questions $(6 \times 5 = 30$ Marks)

1. i) What are degenerate energy states?
   ii) List any two significances of ψ and $\psi 2$.
   iii) State Pauli's exclusion principle.
2. Explain the structural features of long form of periodic table.
3. Predict the products of the following reactions.





4. Draw and explain the crystalline structures of NaCl and CsCl.
5. i) Explain Bronsted-Lowry concept of acids and bases. Give its limitations. (4)
   ii) Separate Lewis acids and bases in the following pairs. (2)
   a) NH_3; BF_3 ii) NH_3; Cu^{2+}
6. Predict the products formed by the halogenations, sulphonation of 1-propane with suitable mechanism.
7. Explain Mulliken's and Allred Rachow's electronegativity scales.

Contd...

8. i) A moving ball weighing 200 g is to be located within 0.2 $\mathring{A}$. What is the uncertainty in the velocity? (3)
   ii) Calculate de Broglie's wavelength of a xenon atom moving with a velocity of 2.4 $\times$ 102 m sec–1. (Atomic weight of xenon is 2.2 $\times$ 10–25 kg) (3)

Section B

Answer any **THREE** questions $(3 \times 10 = 30$ Marks)

9. Describe the Bohr's postulates and explain the H-spectrum with a neat sketch of spectral series. (4+6)

10. i) What is electronegativity, and how is it related with partial charge and hybridisation?
    ii) Discuss how the variation of ionization potential can be related to the electronic structure of the elements?

11. Ascertain Bayer's strain theory and its applications.

12. What is point defect? Classify and discuss the defects in crystals.

13. i) Differentiate protic and aprotic solvents. (5)
    ii) The presence of common ion can affect solubility and facilitate precipitation- conclude the statement by explaining any two of its applications.

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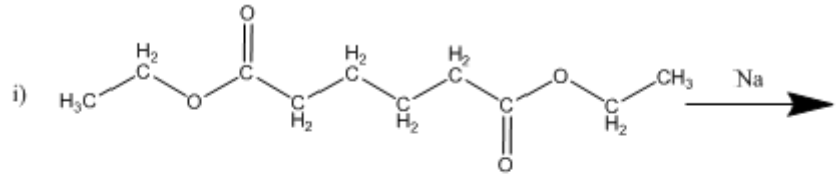

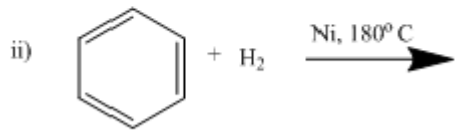

iii) $2CH_3I + Na \longrightarrow$

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