

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.

M.Sc.Chemistry - END SEMESTER EXAMINATIONS - APRIL 2025

SEMESTER - IV

24PCHET4A05 - Introduction to Material Science

Total Duration : 2 Hrs. 30 Mins.

Total Marks : 60

Section B

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

1. Explain the mechanism of free radical chain polymerization.
2. Define number average molecular weight (M_n) weight average molecular weight (M_w). Explain how they are calculated ?
3. Describe the preparation of nylon and polyester.
4. Explain the manufacture and applications of polystyrene.
5. Discuss the optical, magnetic and mechanical properties nanomaterials.
6. Describe the Chemical Vapor Deposition (CVD) method for synthesising nanomaterials.
7. Discuss the applications of nanoparticles in in agriculture.
8. Explain the glide planes and screw axis.

Section C

I - Answer any **TWO** questions ($2 \times 10 = 20$ Marks)

9. Explain the factors affecting crystallinity and glass transition temperature
10. Discuss the manufacture and applications of polyethylene and polyurethane.
11. Discuss the potential applications of quantum dots in fields of medical imaging and photovoltaics.
12. Describe the working principle of X-ray diffraction (XRD) and how it is used to determine the structure of nanomaterials.

II - Compulsory question ($1 \times 10 = 10$ Marks)

13. Discuss the determination of crystal structure by powder X-ray diffraction method.
