Q.4 D. Discuss the instrumentation, operating principle and application of Transmission Electron Microscopy. **(12)**

OR

Discuss the instrumentation, operating principle and application of Scanning Electron microscopy.

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Roll No..... Total No. of Units : 04

Total No. of Printed Pages : 04

Code No. : B03/402(C)

Third Semester Examination, January 2022

M.Sc. CHEMISTRY

Paper - IV

POLYMER AND NANOCHEMISTRY

Time : 3 Hrs. **Max. Marks : 80**

- Part A and B of each question in each unit consist of very short answer type questions which are to be answered in one or two sentences.

  Part C (Short answer type) of each question will be answered in 200-250 words.

  Part D (Long answer type) of each question should be answered within the word limit 400-450.

Unit - I

Q.1 A. What are copolymers? **(2)**

Q.1 B. What is glass transition temperature? **(2)**

Q.1 C. Explain degree of polymerisation. **(4)**

OR

Explain the factors affecting Tm and Tg.

Q.1 D. Discuss classification of polymers ,block and graft polymers, tacticity of polymers and polymerisation in homogeneous and heterogeneous systems. **(12)**

P.T.O.

OR

Describe the analysis and testing of polymers with special reference to chemical analysis of polymers, spectroscopic methods, thermal analysis and physical testing.

Unit - II

Q.2 A. What is addition polymerisation? **(2)**

Q.2 B. What is elastomers? **(2)**

Q.2 C. Explain Coploymerisation with suitable examples. **(4)**

OR

Explain Compounding with suitable examples.

Q.2 D. Discuss the kinetics and statics of stepwise polymerisation and kinetics of free radical chain polymerisation. **(12)**

OR

What are the various processing techniques of polymers? Discuss calendaring, -die casting, rotational casting and film casting of polymers.

Unit - III

Q.3 A. What are nanomaterials? **(2)**

Q.3 B. What do you mean by green routes to synthesis nanomaterials? **(2)**

Q.3 C. Explain optical properties of nanomaterials. **(4)**

OR

Write one method to synthesis nanomaterial by sol-gel method.

Q.3 D. Discuss quantum confinement, electrical and magnetic properties of nanomaterials. **(12)**

OR

What are the methods for synthesis of nanomaterials? Discuss four methods to synthesis the nanomaterials.

Unit - IV

Q.4 A. Write Debye-Scherrer equation for calculation of size of nanoparticles. **(2)**

Q.4 B. What do you know about FWHM in XRD? **(2)**

Q.4 C. Explain the working of EDAX. **(4)**

OR

Explain the instrumentation of XRD.