

CBCS SCHEME

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18NT53

Fifth Semester B.E. Degree Examination, Jan./Feb. 2021

Characterization Techniques

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. Discuss about various types of characterization techniques in detail. (10 Marks)
b. Write a note on electron diffraction interface and lens aberrations. (10 Marks)

OR

- 2 a. Explain about structural and compositional characterization tool with an example. (10 Marks)
b. Give a detailed note on different types of sources used in XRD. (10 Marks)

Module-2

- 3 a. With a neat sketch explain powder and crystalline XRD techniques. (10 Marks)
b. Explain Debye-Scherrer equation. Add note on X-ray photoelectron Spectroscopy. (10 Marks)

OR

- 4 a. Discuss about X-ray absorption techniques in detail? (10 Marks)
b. Write a note on basic principle, instrumentation and applications of XRD. (10 Marks)

Module-3

- 5 a. With a neat sketch, explain TEM. (10 Marks)
b. Discuss about working and types of AFM. (10 Marks)

OR

- 6 a. Briefly explain SEM in detail. (10 Marks)
b. With a neat sketch explain STM. (10 Marks)

Module-4

- 7 a. Explain about Raman spectroscopy with a neat sketch. (10 Marks)
b. Describe about zeta potential with an example. (10 Marks)

OR

- 8 a. Discuss about UV-Vis Spectrophotometers in detail. (10 Marks)
b. With a neat sketch discuss FTIR Spectrophotometers. (10 Marks)

Module-5

- 9 a. Explain about potentiometry with neat sketch. (10 Marks)
b. With a neat sketch, explain impedance measurement and analysis in detail. (10 Marks)

OR

- 10 Describe about basics of voltammetric techniques in detail:
i) Linear and cyclic voltammetry ii) IV
iii) AC and iv) DC electric measurements
(20 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.