

USN

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

10NT63

Sixth Semester B.E. Degree Examination, June/July 2017
Characterization Techniques

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions, selecting at least TWO questions from each part.

PART – A

- 1 a. Write the principles and applications of x-ray diffraction. (XRD) (12 Marks)
b. Discuss the principles and applications of EDAX (Energy Dispersive X-ray Analysis). (08 Marks)
- 2 a. Define surface morphology. How we can measure Etch pit density? (08 Marks)
b. Explain the use of polarized light microscopy in detail. (12 Marks)
- 3 a. Explain the principle and operation of FTIR. (10 Marks)
b. What is Raman spectroscopy? Explain the operation of Raman spectroscopy. (10 Marks)
- 4 a. Differentiate SEM and TEM. (10 Marks)
b. Discuss in detail, the principle of operation of atomic force microscopy.(AFM). (10 Marks)

PART – B

- 5 a. Explain models for interpretation of nano-indentation load-displacement curves. (10 Marks)
b. Discuss the hardness testing of thin-films and coatings. (10 Marks)
- 6 a. Explain the basic principle, instrumentation and application of Mossbauer spectroscopy. (10 Marks)
b. Explain Electron Spin Resonance (ESR). (10 Marks)
- 7 a. Explain in detail about XPS. (10 Marks)
b. Explain secondary ion mass spectroscopy (SIMS). (10 Marks)
- 8 a. Explain differential scanning calorimetry. (10 Marks)
b. Discuss in detail thermogravimetry. (10 Marks)

* * * * *

Important Note: 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Only recording of communication, applied to candidate and to questions marked Sg, T, G, B, C, D, E, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, Z.