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TONT73

Seventh Semester B.E. Degree Examination, Dec.2017/Jan.2018
Surfaces and Interfaces

Time: 3 hrs.

Max. Marks:100

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

- 1 a. What is a surface? Explain the process of
 - i) Relaxation
 - ii) Reconstruction
 - iii) Missing row reconstruction of surface atoms in surface. (08 Marks)
- b. What is surface tension? Explain briefly about surface tension and their dependence on surfactants and Temperature. (07 Marks)
- c. Mention different types of structural defects at surfaces and explain briefly with neat schematic diagram. (05 Marks)

- 2 a. Describe : i) Rate of adsorption ii) Rate of desorption
 iii) The desorption energy detailed with proper equations. (10 Marks)
- b. Explain the concept of Adsorption isotherms and also explain Langmuir adsorption isotherm and BET adsorption isotherm in detail. (10 Marks)

- 3 a. What is Electron emission? Explain the different types of electron emission along with the neat diagram. (08 Marks)
- b. Explain briefly about the different electron spectroscopy and also explain different types of thermionic emitters used normally. (05 Marks)
- c. Write a short note on ion implantation and surface ionization. (07 Marks)

- 4 a. Mention different microscopic technique used in diagnostic methods and explain any one technique in detail. (10 Marks)
- b. Explain different growth modes in epitaxial growth with neat diagram. (06 Marks)
- c. Write short notes on small angle x-ray scattering. (04 Marks)

PART – B

- 5 a. Explain the phenomenon of Adsorption of gases on solids with factors affecting it. (09 Marks)
- b. Write about purification of colloidal solutions. (05 Marks)
- c. Explain colloidal gold synthesis by “Turkevich method” and its applications. (06 Marks)

- 6 a. Explain the concept of depth profile for minerals. (06 Marks)
- b. Explain about investigation of Adsorption on glass surfaces. (05 Marks)
- c. Describe the concept of grain boundaries and inter granular films for ceramics. (09 Marks)

- 7 a. Discuss the various types of corrosion process. (06 Marks)
- b. Write about corrosion and surface. (04 Marks)
- c. Describe about Electrochemical techniques for surface corrosion studies. (10 Marks)

- 8 a. Write about Electrochemical impedance spectroscopy studies for surface corrosion. (08 Marks)

- b. Discuss about below mentioned results and assessment steps
 - i) Initial characterization
 - ii) Boiler simulation corrosion experiments. (12 Marks)

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 Do not write answers on the remaining blank pages.
 For completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
 2. Any revealing of identification, appear to evaluator and/or equations written.