VTU B.E/B.TECH QUESTION PAPER SET

CBCS
SEMESTER VI

SURFACE SCIENCE AND THIN FILM TECHNOLOGY

Use bookmarks to easily navigate between question papers

CBCS SCHEME

USN | | | | | | | | | | |

15NT654

Sixth Semester B.E. Degree Examination, June/July 2018
Surface Science and Thin Film Technology

Time: 3 hrs. Max. Marks: 80

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

Module-1

1 a. Discuss about Physisorption and Chemisorption. **(06 Marks)**
b. Write a note on adsorption from the solution and its importance. **(05 Marks)**
c. Classify and explain colloids based on their interactions. **(05 Marks)**

OR

2 a. Brief about colloidal gold and its applications. **(07 Marks)**
b. Discuss about atomic structure of clean surface. **(03 Marks)**
c. Explain about types of colloidal solutions. **(06 Marks)**

Module-2

3 a. Discuss in detail about Frank – Van – der – Merwe mode, Stranski – Krastnow mode and Volmer – Weber mode of thin film coating. **(10 Marks)**
b. Discuss common Spin coating defects. **(06 Marks)**

OR

4 a. Write about Spin coating general theory. Mention advantages and limitations of spin coating. **(06 Marks)**
b. Brief about Spin coating thickness equation, Spin speed and Spin coating duration. **(10 Marks)**

Module-3

5 a. Discuss about Sputter coating method. Add a note on advantages and limitations of Sputter deposition. **(12 Marks)**
b. Explain and compare evaporation and sputtering. **(04 Marks)**

OR

6 a. Explain in detail about thin film deposition by evaporation. **(12 Marks)**
b. Discuss about applications of sputter deposition. **(04 Marks)**

Module-4

7 a. Explain about thermal $A\ell_2O_3$ atomic layer deposition and catalytic SiO_2 atomic layer deposition. **(10 Marks)**
b. Write about biomedical applications of ALD. **(06 Marks)**

OR

8 a. Write a short note on atomic layer deposition. **(06 Marks)**
b. Discuss in detail about advantages and limitations of ALD. **(10 Marks)**

Module-5

9 a. Explain in detail about types of anti – reflective coating. **(12 Marks)**
b. Discuss about Nano indentation. **(04 Marks)**

OR

10 a. Write about the theory of Reflection, Rayleigh film and Interference coating in anti-effective coatings. **(12 Marks)**
b. Explain about Self – cleaning glasses. **(04 Marks)**

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Time: 3 hrs. Max. Marks: 80

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

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.

Module-1

1 a. What are Physisorption and Chemisorption? Explain. **(06 Marks)**
b. Briefly explain Colloidal silver. Mention its drawbacks. **(06 Marks)**
c. Write the difference between Adsorption and Absorption. **(04 Marks)**

OR

2 a. What are the important properties of Colloidal solution? **(06 Marks)**
b. Briefly explain the applications of adsorption. **(06 Marks)**
c. Classify between Colloids and Suspensions. **(04 Marks)**

Module-2

3 a. Discuss in detail Frank – Van – der – Merwe mode, Stranski – Krastanow mode and Volmer – Weber mode of thin film coating. **(10 Marks)**
b. Write a note on Spin coating method of thin film deposition. **(06 Marks)**

OR

4 a. Discuss Spin coating thickness equation, Spin speed and Spin coating duration. **(10 Marks)**
b. Write a note on Dip Coating method of thin film deposition. **(06 Marks)**

Module-3

5 a. Explain in detail Sputter deposition method. **(12 Marks)**
b. Discuss Electron beam heating technique. **(04 Marks)**

OR

6 a. Explain in detail Thin film deposition by evaporation. **(12 Marks)**
b. Compare Evaporation and Sputtering. **(04 Marks)**

Module-4

7 a. Write a short note on Atomic Layer deposition. **(06 Marks)**
b. Explain the Microelectronic Applications of Atomic layer deposition. **(10 Marks)**

OR

8 a. Discuss Chemical bath deposition technique. **(06 Marks)**
b. Explain the advantages and limitations of atomic layer deposition. **(10 Marks)**

Module-5

9 a. Write a note on antireflective coating, corrective lenses and photolithography. **(06 Marks)**
b. Discuss Self cleaning glasses. **(06 Marks)**
c. Explain Single layer and Multilayer interference. **(04 Marks)**

OR

10 a. Write a note on the Theory of Reflection and Rayleigh film. **(06 Marks)**
b. Discuss nano indentation. **(06 Marks)**
c. Explain Textured coating. **(04 Marks)**

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