

CBCS SCHEME

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15NT43

Fourth Semester B.E. Degree Examination, Dec.2018/Jan.2019 Synthesis and Processing Techniques

Time: 3 hrs.

Max. Marks: 80

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

Module-1

- 1 a. Mention the different types of CVD techniques. Explain in detail the CVD method including hot wall and cold wall setup. (10 Marks)
- b. Write a short note on ball milling synthesis with a neat labelled schematic diagram. (06 Marks)

OR

- 2 a. Explain in detail the PVD method with a diagram. Mention the advantages and disadvantages and the applications of PVD. (08 Marks)
- b. Define atomic layer deposition. Explain in detail the ALD technique for this film depositions with a neat diagram. (08 Marks)

Module-2

- 3 a. Explain the working process of chemical reduction method with an example of nanoparticle synthesizing. (08 Marks)
- b. Define sol and gel. Explain in detail the sol-gel method with proper diagrams of sol-del options. (08 Marks)

OR

- 4 a. Explain the formation of micelles and inverse micelles with diagrams and the possibilities of different shapes formed by micelles/inverse micelles. (10 Marks)
- b. Write short notes on supercritical fluid and solvothermal process of nanoparticle synthesis. (06 Marks)

Module-3

- 5 a. Explain the growth mechanism, kinetics and rate determining steps in VLS method. (08 Marks)
- b. Explain the process involved in the chemical vapour condensation with a neat labelled CVC reactor. (08 Marks)

OR

- 6 a. Explain in detail the flame spray pyrolysis working process with a diagram. (08 Marks)
- b. Write short notes on VLS (Vapour-Liquid-Solid) and SLS (Solution-Liquid-Solid) processes. (08 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.

Module-4

- 7 a. Draw electron beam lithography set up and explain working process in detail. (10 Marks)
b. Define nanolithography. Explain the nanolithography based on AFM. (06 Marks)

OR

- 8 a. Define self-assembly and explain the process of self-assembly of nanoparticles and nanowires. (08 Marks)
b. Write short notes on oxidation, metallization and mask with its applications. (08 Marks)

Module-5

- 9 a. Explain the process of developing photo catalyst inserted into surface of porous alumina silicate. (10 Marks)
b. Explain in detail the process involved in developing functional skincare cosmetics. (06 Marks)

OR

- 10 a. Explain the fabrication technique of organic nanocrystals their optical properties and materialization. (10 Marks)
b. Explain briefly about surface modification of inorganic nanoparticles by organic functional groups. (06 Marks)
