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**Fifth Semester B.E. Degree Examination, Jan./Feb. 2021**  
**Synthesis of nanomaterials**

Time: 3 hrs.

Max. Marks: 100

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

**Module-1**

- 1 a. Write a note on metal oxide and semiconductor nanoparticles. Explain the procedure involved in the synthesis of CdO and AgO nanoparticles. (10 Marks)
- b. Explain different methods to synthesis ZnO nanoparticles. Add note on applications of ZnO nanoparticles. (10 Marks)

OR

- 2 a. Describe the synthesis of CdSe and ZnS semiconductor nanoparticles. Mention their applications. (08 Marks)
- b. Write a note on synthesis of CuO nanoparticles. Add a note on advantages and limitations of CuO nanoparticles. (04 Marks)
- c. Describe the synthesis of CdS and TiO<sub>2</sub> semiconductor nano structures. Mention their applications. (08 Marks)

**Module-2**

- 3 a. Discuss about quantum dots, their advantages, limitations, and applications in bio-imaging with an example. (10 Marks)
- b. Describe the potential uses of quantum dots. (04 Marks)
- c. Explain the synthesis of AgS nanostructure. Add a note on advantages and limitations of AgS nanostructures. (06 Marks)

OR

- 4 a. Mention the methods of synthesis of ZnS nanostructures. Add a note on advantages, limitations and applications of ZnS nanostructures. (10 Marks)
- b. Explain synthesis of Ag and Au nanoparticles by chemical method. (06 Marks)
- c. How toxicity of CdSe quantum dot can be reduced? Explain with an example. (04 Marks)

**Module-3**

- 5 a. Describe the steps involved in synthesis of CoFe<sub>2</sub>O<sub>4</sub>, M<sub>n</sub>Fe<sub>2</sub>O<sub>4</sub> and CoCrFe<sub>2</sub>O<sub>4</sub> nanoparticles. (10 Marks)
- b. Explain the potential uses of oxide and nano-oxide nanoparticles. (10 Marks)

OR

- 6 a. Write a note on properties, advantages and limitations of oxide and non-oxide nanoparticles. (08 Marks)
- b. Explain magnetosomes, and their synthesis by biological methods. (06 Marks)
- c. Write a note on advantages, limitations, and applications of magnetite nanoparticles. (06 Marks)

**Module-4**

- 7 a. Describe the synthesis of aluminium phosphate and iron phosphates. (08 Marks)
- b. Explain the synthesis of copper and nickel phosphates. (06 Marks)
- c. Define nanoporous materials, add a note on advantages, limitations, and applications of nanoporous materials. (06 Marks)



OR

- 8 a. Write a note on synthesis of aluminosilicate zeolites. Explain their applications. (08 Marks)  
b. Explain the potential uses of nanoporous materials. (04 Marks)  
c. Describe the synthesis of zirconium and titanium phosphates. (08 Marks)

Module-5

- 9 a. Describe the steps involved in the synthesis of nanoparticles using bacteria. Mention their applications. (10 Marks)  
b. Write a short note on magnetotactic bacteria for natural synthesis of magnetic nanoparticles mention the applications. (10 Marks)

OR

- 10 a. Discuss the advantages, limitations, and application of biological methods involved in synthesis of nanoparticles. (06 Marks)  
b. Describe the steps involved in green synthesis of nanoparticles. (10 Marks)  
c. Explain the role of Tobacco mosaic virus as the components for the formation of nanostructured materials. (04 Marks)

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