Code No: 07A80301 **R07** **Set No. 2**

IV B.Tech II Semester Examinations,April/May 2012
NANOTECHNOLOGY
Mechanical Engineering

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

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1. (a) Explain the preparation of sample for TEM study.
   (b) Explain about Sintering of Ceramic materials. [8+8]
2. What is the importance of the Operator in Quantum mechanics? Explain about the Hamiltonian Operator. [16]
3. (a) Explain the stress intensity factor.
   (b) Explain the hook's law. [8+8]
4. Explain the Refractive Index and Dispersion in glasses with equations. [16]
5. Discuss about targeted drug delivery using nanoparticles. [16]
6. Give basic requirements for the delivery of a nanoparticle-drug system via oral administration. [16]
7. Write a note on electron gun of a typical SEM. [16]
8. Explain about zero dimensional structure or one dimensional structure of nanomaterials. [16]

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Code No: 07A80301 **R07** **Set No. 4**

IV B.Tech II Semester Examinations,April/May 2012
NANOTECHNOLOGY
Mechanical Engineering

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

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1. What are nanomaterials? Explain about different methods to produce nanomaterials. [16]
2. Explain about different types of bonding in solids. [16]
3. Write a note on applications of AFM. [16]
4. Explain spontaneous emission and stimulated emission. Differentiate between them with regard to principle, working, advantages, limitations and applications. [16]
5. (a) What are the parameters of magnetization of ferrites and hysteresis?
   (b) Distinguish between soft and hard magnetic materials. [8+8]
6. Briefly explain the synthesis of Alumina nano particles by mechanical attrition.[16]
7. Explain various kinds of nanosystems used in nanomedicine. [16]
8. Explain about the nanosensors based on optical properties. [16]

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Code No: 07A80301 **R07** **Set No. 1**

IV B.Tech II Semester Examinations,April/May 2012
NANOTECHNOLOGY
Mechanical Engineering

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

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1. What is nanotribology? Explain in detail. [16]
2. (a) List out the properties of Silicon Carbide.
   (b) List out the applications of Silicon Carbide. [8+8]
3. What are the advantages of noble metal nanoparticles? [16]
4. Explain Electro-Optic Effects in detail. [16]
5. What are colloids? Explain about the molecules in colloids. [16]
6. Write a note on bulk specimen interactions used in SEM. [16]
7. Explain the applications of magnetization data of nano particles of magnetite. [16]
8. Write a note on Hyperfine splitting. [16]

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Code No: 07A80301 **R07** **Set No. 3**

IV B.Tech II Semester Examinations,April/May 2012
NANOTECHNOLOGY
Mechanical Engineering

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

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1. Briefly explain about characterization of nano particles by electron microscopy.[16]
2. Write an essay on Verwey Transition of Nano Particles in detail. [16]
3. Briefly discuss about the interaction of biomolecules and nanoparticles surfaces. [16]
4. What are characteristic and continuous x-rays? What x-rays are used for crystal structure determination? [16]
5. (a) Explain the hyperfine field in nano particles.
   (b) Explain the spin canting in nano particles of magnetite. [8+8]
6. List out some applications of optical transitions in laser materials. [16]
7. Discuss about Hydrothermal method used in preparation of nanomaterials. [16]
8. Discuss about single molecular devices. [16]

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