Code No: 56014 **R09**

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech III Year II Semester Examinations, April - 2018
NANO TECHNOLOGY
(Common to AE, EEE, ECE, ME)

Time: 3 hours **Max. Marks: 75**

Answer any five questions
All questions carry equal marks
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1.a) Explain briefly how "Optical Properties" vary in case of nanomaterials by considering gold nanoparticles as special example.
b) Discuss the classification of magnetic materials based on magnetic domains. [8+7]

2.a) What do you mean by Quantum confinement? Explain this concept for 0D, 1D, 2D and 3D nonmaterial's with suitable examples.
b) Distinguish briefly Quantum wells and Quantum dots. [8+7]

3.a) Distinguish C60, C80 and C240 Nanostructures briefly.
b) Why single wall carbon nanotube (SWCNT) differ significantly with multi wall carbon nanotube (MWCNT)? Explain briefly the structure related properties in both of them. [7+8]

4. Write short notes on the following:
a) Plasma arc technique
b) Ion sputtering
c) Laser ablation. [5+5+5]

5.a) What information Atomic Force Microscopy (AFM) characterization tool gives? Discuss briefly the working principle and mode of operation.
b) Discuss briefly the working principle of Transmission Electron Microscopy (TEM). [8+7]

6. What do you mean by Core-shell nanoparticles? Will layer by layer assembly methodology help to form these assemblies? Discuss the applications of these in drug delivery systems with a neat sketch. [15]

7.a) How the resistivity of nanomaterials different from bulk materials? Explain the magneto resistance (nano) concept of GMR?
b) Compare and contrast GMR and TMR. [8+7]

8. What is lithography? Discuss briefly about e-beam lithography, Ion beam lithography and SEM based nanolithography. [15]

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