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B.E / B.Tech (Full Time) DEGREE END SEMESTER EXAMINATIONS, APRIL /MAY. 2014

**ELECTRICAL AND ELECTRONICS ENGINEERING
VII Semester**

EE9027 NANOTECHNOLOGY

(Regulation 2008)

Time: 3 Hours

Answer ALL Questions

Max. Marks 100

PART-A (10 x 2 = 20 Marks)

1. What are the induced effects due to increase in surface area of nanoparticles?
2. What is target drug delivery?
3. Distinguish between CVD and PVD
4. What are the advantages of RF Sputtering over DC sputtering?
5. What is soft lithography?
6. What is the maximum number of particles ($\geq 0.3\mu\text{m}$) permitted in an ISO 1 clean room?
7. Mention the applications of AFM.
8. What are the limitations of TEM?
9. What is coulomb blockade in SET?
10. Draw the structure of molecular electronics XOR gate

Part – B (5 x 16 = 80 marks)

11. (i) Discuss about the implication of nanotechnology. (8)
(ii) Write a technical note on "scaling laws and its significance" (8)
12. a) What are the advantages of ALD? With neat sketches, describe the nanoparticle synthesis using ALD.

OR

- b) With neat diagrams explain the operation of MOCVD in detail.

13. a) Explain the Electron Beam lithography process in detail. Mention its merits and Limitations.

OR

b) (i) Discuss the features and specifications of US FED STD 209E clean room standards. (8)

(ii) Write a technical note on clean room protocols (8)

14. a) Explain the construction and operation of Scanning Electron Microscope with neat sketches.

OR

b) With suitable sketches explain the operation of SIMS in detail. Also discuss its applications.

15. a) Design and discuss the operation of Quantum Cellular Automata based digital logic gates.

OR

b) (i) With a neat diagram explain the principle of operation of RTD (8)

(ii) Draw and discuss the operation of CNT-FET. (8)