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Roll No

MNT - 204**M.E./M.Tech., II Semester**

Examination, December 2015

Nanoscale Devices*Time : Three Hours**Maximum Marks : 70*

- Note :** i) This question paper contains total eight questions.
 ii) Attempt any five questions. All questions carry equal marks.

1. Explain the principle, working and applications of plasma enhanced CVD system? Discuss the benefit of substrate rotation in this technique. 14
2. What is meant by thermal matching? Discuss the effect of lattice mismatch in device fabrication. 14
3. Describe X-ray lithography including plasma X-ray sources. Give its application, advantages and disadvantages. 14
4. Discuss the synthesis of quantum well. What are the deciding factor affecting its thickness. 14
5. What are MODFETs [Modulation-Doped Field Effect Transistors]? How they are different from conventional FETs? Discuss their advantages. 14

6. What is molecular manipulation? How controlled molecular manipulation can be performed by STM. 14
7. What are photo resist technologies for the nanoscale device fabrication? Discuss about the methods of metrology and defect inspection. 14
8. Write short notes on any two of the following: 14
 - a) Nano-sphere lithography
 - b) Coulomb blockade
 - c) Epitaxial methods for semiconductor processing
 - d) Carrier transport phenomena in a nanoscale device
 - e) Resonant tunnelling diodes
