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B1 – 2640

Reg. No. :

Name :

**Eighth Semester B.Tech. Degree Examination, January 2017
(2008 Scheme)**

08.801 : NANOELECTRONICS (TA)

Time : 3 Hours

Max. Marks : 100

PART – A

Answer **all** questions. **Each** question carries **4** marks.

1. List out the limitations of conventional microelectronics.
2. Explain briefly about the different approaches for fabrication of nanomaterials.
3. What are NEMS ?
4. Explain the significance of Debye-Scherrer formula.
5. What are the main characteristic lengths used in mesoscopic systems ?
6. Briefly explain Coulomb blockade effect.
7. What are the advantages of chemical vapour deposition ?
8. Explain briefly about quantum hall effect.
9. What are CNT transistors ?
10. Obtain the wave function for a quantum dot.

PART – B

Answer **any two** questions from each Module. **Each** question carries **10** marks.

Module – 1

11. Explain the working principle and operation of Scanning Electron Microscope (SEM) with suitable diagrams.
12. Write notes on :
 - 1) Laser ablation
 - 2) Physical vapour deposition
13. Explain chemical vapour deposition process. What are the different types ?

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Module – 2

14. Explain :
- a) Aharonov -Bohm effect.
 - b) Shubnikov - de Hass effect.
15. Determine the electron wave function for a finite potential triangular quantum well and write the equation of square quantum wells also.
16. What are heterojunctions ? What are the advantages and also explain briefly about modulation doped quantum wells.

Module – 3

17. With suitable diagrams explain the operation of quantum well laser.
18. Explain the working of resonant tunnel diodes.
19. Explain briefly about :
- a) Single electron transistor.
 - b) Quantum dot LED.

