

Reg. No. :

Name :

Eighth Semester B.Tech. Degree Examination, November 2015

(2008 Scheme)

08.801 : NANOELECTRONICS (TA)

Time : 3 Hours

Max. Marks : 100

PART – A

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



1. Mention three applications of nanotechnology.
2. What is self assembly ?
3. Give the principle of photoluminescence spectroscopy.
4. Draw the bandstructures of npn homojunction and heterojunction transistors.
5. Compare SETs and MOSFETs.
6. Discuss the principle of stimulated emission.
7. What is microlaser ? Explain its principle.
8. What are the possible energy levels in a quantum wire ?
9. What is Bloch oscillation ? Give an expression for the period of Bloch oscillation.
10. What is quantum Hall effect ? What are its applications ? **(10×4=40 Marks)**

P.T.O.



PART – B

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

Module – I

11. Explain the limitations of conventional microelectronics in detail.
12. Explain any one chemical vapour deposition method.
13. With a suitable schematic, explain the operation of atomic force microscope.

Module – II

14. Explain the theory involved in integer quantum Hall effect.
15. Draw the density of states for a 1D and 2D electron system and explain.
16. Briefly discuss about modulation – doped quantum and multiple quantum wells.

Module – III

17. Explain the principle of operation of MODFET and mention its few advantages.
18. Explain in detail device structure and characteristics of resonant tunneling transistor.
19. Describe the working principle of heterojunction semiconductor laser.

(6×10=60 Marks)
