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MEVD - 204

M.E./M.Tech., II Semester

Examination, June 2016

Microelectronics

Time : Three Hours

Maximum Marks : 70

Note : i) Attempt any five questions.
ii) All questions carry equal marks.

1. a) Give a brief theory of band-structure in crystals.
   b) Give a brief review of density function theory.

2. a) Explain about the problem of the particle in a one dimensional lattice.
   b) Discuss Kronig-Penney model.

3. a) What is carrier life time? Explain in terms of semi conductor lasers.
   b) Give some statistics of carrier in semi conductors.

4. a) Explain briefly about collisionless Boltzmann equation often called Vlasov equation.
   b) Discuss briefly about carrier transport in semi conductors.

5. a) What are hot electrons? When are they generated? Also explain what is negative differential resistance.
   b) Explain briefly about the electric field dependence and velocity saturation.

6. Discuss in detail about EberMoll and small signal models.

7. a) Explain the switching characteristic of P-N junction diode.
   b) Discuss briefly about Non uniformly doped transistor.

8. Write short notes on any two of the following:
   a) High current and high frequency effect
   b) Effective mass
   c) Excess currents and breakdown in P-N junction

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