R09

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
M. TECH I SEMESTER EXAMINATIONS APRIL/MAY-2012
DEVICE MODELING
(VLSI SYSTEM DESIGN)

Time: 3hours   **Max.Marks:60**

Answer any five questions
All questions carry equal marks
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1. Explain basic equations for semi-conductor device operation.
   a) Gauss's law
   b) Continuity equation
   c) Carrier transport equation.

2. Explain PN junction diode with the electrical field and potential distributions.

3. Explain the operation of schottky diode with neat sketches. Also explain its small and large signal models.

4.a) Explain diffusion transistor at high frequencies.
   b) Give Basic Model, Gunmel–Poon model, dynamic model & SPICE models of Integrated Bipolar Transistor.

5.a) Explain high frequency MOSFET model.
   b) Discuss MOS Device equations and threshold voltage equations.

6. Explain MOSFET SPICE models indetail.

7.a) Explain CMOS fabrication using twin tub process.
   b) Explain the terms Wafer Processing, Patterning and diffusion.

8.a) Explain band gap offset at abrupt hetero junction.
   b) Obtain Modified current continuity equations and explain its significance.

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