HONOUR SUBJECT

PET5D001   ELECTRONICS DEVICES AND MODELING

MODULE – I
1. **PN–Junction Diode and Schottky Diode:** DC Current-Voltage Characteristics, Static Model, Large-Signal Model, Small-Signal Model, Schottky Diode and its Implementation in SPICE2, Temperature and Area Effects on the Diode Model Parameters, SPICE3, HSPICE and PSPICE Models

MODULE– II
2. **Metal-Oxide-Semiconductor Transistor (MOST):** Structure and Operating Regions of the MOST, LEVEL1 Static Model, LEVEL2 Static Model, LEVEL1 and LEVEL2 Large-Signal Model, LEVEL3 Static Model, LEVEL3 Large-Signal Model, The Effect of Series Resistances, Small-Signal Models, The Effect of Temperature.

MODULE–III
3. **BJT Parameter Measurements:** Input and Model Parameters, Parameter Measurements**,**
4. **MOST Parameter Measurements:** LEVEL1 Model Parameters, LEVEL2 Model (Long-Channel) Parameters, LEVEL2 Model (Short-Channel) Parameters, LEVEL3 Model Parameters, Measurements of Capacitance, BSIM Model Parameter Extraction **Noise and Distortions:** Noise, Distortion.

MODULE–IV
5. **Bipolar Junction Transistor (BJT):** Transistor Conversions and Symbols, Ebers-Moll Static Model, Ebers-Moll Large-Signal Model, Ebers-Moll Small-Signal Model, Gummel-Poon Static Model, Gummel-Poon Large-Signal Model, Gummel-Poon Small-Signal Model, Temperature and Area Effects on the BJT Model Parameters, Power BJT Model, SPICE3, HSPICE and PSPICE Models.

Additional Module (Terminal Examination-Internal)
6. BSIM1, BSIM2, SPICE3, HSPICE and PSPICE Models

Textbooks
1. Semiconductor Device Modeling with SPICE,Giuseppe Massobrio and Paolo Antognetti, Tata McGraw-Hill Education, 2nd edition, 2010.

Reference Books
1. Device Electronics for Integrated Circuits, Richard S. Muller, Theodore I. Kamins, and Mansun Chan, John Wiley and Sons, New York, 3rd edn.,2003.
2. Devices for Integrated Circuits: Silicon and III-V Compound Semiconductors, H. Craig Casey, John Wiley, New York, 1999.
3. Semiconductor Material and Device Characterization, Dieter K. Schroder, John Wiley and Sons, New York, 1990.