Registration No:

Total Number of Pages : 02   **M.TECH**

M.TECH 2^(ND) SEMESTER REGULAR EXAMINATIONS, MAY 2018
SEMICONDUCTOR DEVICE MODELLING
Branch: EC, Subject Code:MECPE2033
Time: 3 Hours
Max Marks : 70

PART-A   (10 X 2=20 MARKS)
1. Answer the following questions.

. a)What are the limitations of ideal diode model?   **(CO1)**

 b) Define avalanche multiplication.   **(CO2)**

 c) Draw the SPICE2 reverse characteristics of the real diode.   **(CO4)**

 d) What do you mean by HSPICE models?   **(CO3)**

 e) Draw the structure of power BJT.   **(CO1)**

 f) Write the expression of transconductance of JFET.   **(CO2)**

 g) How the temperature and area factor effects on the JFET model parameters?   **(CO3)**

 h) Draw the large signal model for the n-channel MOSFET.   **(CO4)**

 i) What do you mean by IGFET?   **(CO2)**

 j) What is the use of BSIM1 model in MOSFET?   **(CO4)**

PART-B   (5 X 10=50 MARKS)
Answer any five questions from the following.

2.a. Explain the temperature dependence of diode characteristics.   **[5] (CO1)**

 b. Explain the small signal model of the diode & it's implementation in SPICE2.   **[5](CO2)**

3. a. Describe the operation of BJT by using Ebbers-Moll static model.   **[5] (CO3)**

 b. Describe the operation of BJT by using Gummel-poon static model**.**   **[5] (CO3)**

.

4. a. What are the second order effects in Ebbers-Moll static model? Explain it.   **[5] (CO4)**

   b. Differentiate large signal model & small signal model of JFET with proper
      Circuit diagram.   **[5](CO2)**

5. a. Are there any limitations in Ideal theory of JFET? Justify your answer.   **[5] (CO1)**

   b. Draw the structure of MOST & explain the fabrication steps.   **[5] (CO2)**

6. a. With small signal equivalent circuit explain noise model BJT.   **[5](CO4)**

   b. What are the sources of noise? Briefly describe.   **[5] (CO1)**

7. a. With small signal equivalent circuit explain noise model BJT.   **[5](CO3)**

   b. Explain the concept of channel length modulation.   **[5](CO4)**

8. Write short notes on
   a. Distortion at high frequency   [5]**(CO2)**
   b.Hot electron effect   [5]**(CO1)**

==0==