Sem-III (CBGS)
Br: Electronics
Electronics Devices

12/5/16

QP Code : 30554

(3 Hours) [Total Marks : 80

N.B. : (1) Question No. **1** is **compulsory** and Solve any **three** questions from remaining questions
(2) Assume suitable data wherever applicable.
(3) Draw neat and clean diagrams.

1. Answer any **four.** **20**
   (a) Justify that the space charge width increase with reverse biased voltage in a p-n junction diode.
   (b) Explain zener diode application as voltage regulator.
   (c) Define internal pinchoff voltage, pinchoff voltage and drain to source saturation voltage.
   (d) Describe construction and V-I characteristics of IGBT.
   (e) Explain two terminal MOS structure.

2. (a) Explain concept, working and characteristics of Tunnel diode. **10**
   (b) Explain the types of junction breakdown in case of zener diode. **10**

3. (a) For a n-channel JFET with I_{DSS} = 8 mA, V_P = -4 V **10**
      (i) If ID = 3mA calculate the value of V_{GS}
      (ii) Calculate $V_{DS\ (SAT)}$ for ID = 3mA
      (iii) Calculate transconductance (g_m)
   (b) Explain minority carrier distribution in BJT considering transistor in active, cut off and saturation mode. **10**

4. (a) Compare Enhancement type and Depletion type MOSFET on the basis of their construction, working principle, characteristics and biasing. **10**
   (b) Discuss construction and working of SCR with its characteristics in detail. **10**

5. (a) Discuss Ebers-Moll model for BJT in detail. **10**
   (b) Discuss HBT in detail. **10**

6. Write short notes **20**
   (a) Optocoupler
   (b) Gunn diode
   (c) MESFET
   (d) DIAC-TRIAC

FW-Con. 9412-16.