M.Sc. F.Y. (Electronics) (Old / New C.B.C.S. Pattern) Sem-I

ELE101 / PSCELET01 - Fundamental of Semiconductor Devices Paper-I

P. Pages : 1 **GUG/S/19/11154**

Time : Three Hours * 3 0 9 4 * Max. Marks : 80

Notes : 1. All questions are compulsory and carry equal marks.
2. Draw neat and labelled diagram whenever necessary.
3. Use of log table / calculator is allowed.

1. Either

a) Describe the intrinsic and extrinsic semiconductor on the basis of energy band model and valence band model. **8**

b) Explain construction and uses of PIN diode. Explain how PIN diode is different from PN junction diode. **8**

OR

c) Draw the energy level diagram of PN junction and explain how it works. **8**

d) What is IMPATT diode and explain the working of a IMPATT diode with the help of schematic diagram. **8**

2. Either

a) Explain the various configuration of bipolar transistor. Describe input and output characteristics of CE configuration. **8**

b) Describe Ebers - Moll equation and model of PNP transistor. **8**

OR

c) Explain the working of switching transistor. Draw its characteristics. **8**

d) Describe Alpha and beta cutoff frequencies in transistor. **8**

3. Either

a) What is Schottky effect ? Explain differentiate between JFET and BJT. **8**

b) What is Charge Coupled Devices (CCD) ? Describe operation of CCD. **8**

OR

c) Explain construction and working of Junction Field Effect Transistor (JFET). Draw its characteristics. **8**

d) Describe basic structure and the working of MOSFET. **8**

4. Either

a) What is "photovoltaic effect" ? Explain photovoltaic effect in PN-junction. **8**

b) Explain construction and working of an avalanche photodiode. **8**

OR

c) Describe radiative and non radiative transitions in LED's. **8**

d) Explain the working of PN-junction LASER with the help of energy band diagram. **8**

5. a) Explain the construction of TRAPATT diode. **4**

b) What is microwave transistor ? Explain. **4**

c) What is Schottky effect ? Explain. **4**

d) Explain population inversion. **4**

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