Roll No. | | | | | | | | | | | | | **Total No. of Pages : 01**

Total No. of Questions : 08

M.Tech (VLSI D) (2018 Batch) (Sem.–3)

PROCESS AND DEVICE CHARACTERIZATION & MEASUREMENTS

Subject Code : MTVL-PE5B-18

M.Code : 76595

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

INSTRUCTIONS TO CANDIDATES :

1.Attempt any FIVE questions out of EIGHT questions.

2.Each question carries TWELVE marks.

1. *Compare two-point and four-point probe* measurement techniques. Derive the four-point probe resistivity expression.
2. a) Explain the *differential Hall effect* techniques for determining dopant density profiles.
   b) Explain *two-contact two-terminal*, contact resistance measurement techniques.
3. a) Discuss generation-recombination statistics.
   b) Explain deep-level transient spectroscopy technique.
4. Explain recombination lifetime/surface recombination velocity with the help of suitable diagram. How does surface recombination affect the effective recombination lifetime?
5. a) Explain photoconductance decay lifetime characterization technique.
   b) What recombination/generation parameters can be determined from gate-controlled diode measurements? Draw Gate-controlled diode in accumulation, depletion and inversion regions.
6. a) How does the diode reverse recovery technique work?
   b) Discuss the working principle of *scanning electron microscope* and its applications.
7. a) Explain *process* and *SPICE model parameter extraction*.
   b) Explain *ellipsometry* with the help of suitable diagram. Also list its applications.
8. Write short notes on the following :
   a) Metal-semiconductor contacts b) Carrier lifetime

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.