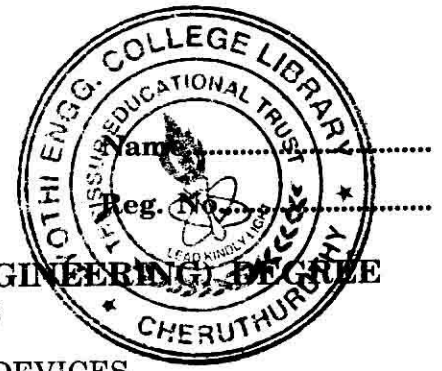


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**FOURTH SEMESTER B.TECH. (09 SCHEME) (ENGINEERING DEGREE)
EXAMINATION, APRIL 2015**

EC 09 406/PTEC 09 405—SOLID-STATE DEVICES

Time : Three Hours

Maximum : 70 Marks

Part A

Answer all questions.

Each question carries 2 marks.

- I. 1 State the difference between Intrinsic and Extrinsic semiconductors.
2 What is a Schottky diode ?
3 Define Pinch off voltage.
4 Define Threshold voltage.
5 State two applications of Insulated Gate Bipolar transistor.

(5 × 2 = 10 marks)

Part B

Answer any four questions.

Each question carries 5 marks.

- II. 1 Explain Fermi level and quasi Fermi level.
2 Discuss about the capacitance of $p-n$ junction.
3 Explain about metal semiconductor junctions.
4 Explain Kirk effect.
5 Write notes on substrate bias effects of MOSFET.
6 Write notes on Power MOSFET.

(4 × 5 = 20 marks)

Part C

Answer all questions.

Each question carries 10 marks.

- III. 1 Explain :
(i) Direct and indirect band gap semiconductors.
(ii) Continuity equation.

Or

Turn over

2 Explain :

- (i) Effective mass of carriers.
- (ii) Temperature dependence of carrier concentrations.

3 (a) Explain the working of Varactor diode.

(b) Explain avalanche breakdown.

Or

4 (a) Explain the working of Zener diode.

(b) Write notes on graded junctions.

5 Explain the working of Hetero junction bipolar transistors.

Or

6 Explain the working of JFET.

7 Explain the working of n-channel MOSFET. Discuss its characteristics.

Or

8 Explain the working of SCR. Discuss its characteristics.

(4 × 10 = 40 marks)