C 80693 (Pages : 2)

Name .....

Reg. No. .....

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 votlage.

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)