C 61585 (Pages : 2) Name.....

Reg. No.....

FOURTH SEMESTER B.TECH. (ENGINEERING) DEGREE EXAMINATION, APRIL 2014

(2009 Scheme)

EC 09 406/PTEC 09 405 – SOLID STATE DEVICES

Time : Three Hours Maximum : 70 Marks

Part A

I. (a) What are direct band gap semiconductor?

(b) State an advantage of graded functions.

(c) What is a rectifier?

(d) What is Kirk effect?

(e) What is a power diode?

(5 × 2 = 10 marks)

Part B

II. (a) Explain the energy band diagram of semiconductors.

(b) Explain about the capacitance of *pn* junction in *pn* junction diode.

(c) Explain the advantages of JFET over BJT. Explain the VI characteristics of JFET.

(d) Write notes on hetero junction bipolar transistors.

(e) Write notes on Insulated gate biopolar transistor.

(f) Explain the substrate bias effects of MOSFET.

(4 × 5 = 20 marks)

Part C

III. (a) Write notes on :

(i) Intrinsic and extrinsic semiconductors.

(ii) Diffusion and drift of change carriers.

Or

(b) Write notes on :

(i) Conductivity and mobility of carriers.

(ii) Temperature dependence of carrier concentration.

Turn over

IV. (a) Explain :

(i) Zener and avalanche breakdown.

(ii) Metal semiconductor junction.

Or

(b) (i) Explain the working of Varctor diode.

(ii) Explain the VI characteristics of tunnel diode.

V. (a) Explain the working of BJT as a switch.

Or

(b) Explain the frequency limitations of transistor.

VI. (a) Explain the accumulation, depletion and strong inversion regions of working of a MOSFET.

Or

(b) Explain the

(i) VI characteristics of SCR.

(ii) Write notes on Power MOSFETs.

(4 × 10 = 40 marks)