THIRD SEMESTER B.TECH. (ENGINEERING) DEGREE EXAMINATION DECEMBER 2009

EE 04 305—ELECTRONICS—I

(2004 admissions)

Time : Three Hours   Maximum : 100 Marks

Answer **all** *questions.*

Part A

I. (a) Explain the features of Schottky diode.

(b) Explain the characteristics of JFET.

(c) What is meant by piecewise linear model of a diode.

(d) Explain the working of positive and negative clamper.

(e) Mention the *three* sources of instability of collector current. Define *three* stability factors.

(f) What is cross over distortion and how it can be minimized ?

(g) Explain the selection of bypass capacitor in transistor amplifier.

(h) Distinguish between difference input signal and common mode input signal.

$(8 \times 5 = 40$ marks)

Part B

II. (a) Explain the charge density in extrinsic semi-conductor.   (8 marks)

(b) Explain the electrical characteristics of silicon and germanium.   (7 marks)

Or

(c) Explain the characteristics of CE-BJT.   (9 marks)

(d) Compare E-MOSFET and D-MOSFET.   (6 marks)

III. (a) Explain with relevant diagrams, the operation of full-wave rectifier. Derive the expression for (i) d.c. current ; (ii) d.c. load voltage ; (iii) a.c. r.m.s. current.

(10 marks)

(b) What are the merits and demerits of full-wave rectifier.   (5 marks)

Or

(c) Explain the operation of different types of clipper circuits. What are its practical applications ?

(15 marks)

IV. (a) Draw the *h*-parameter equivalent circuit of CE amplifier and derive the expressions for current gain, input resistance, voltage gain and output admittance.

(15 marks)

Or

(b) What is a push-pull amplifier ? List out it advantages. (5 marks)

(c) Draw the circuit of a class B, BJT push-pull amplifier and derive the expression for its collector efficiency.

(10 marks)

V. (a) Explain the frequency response characteristics of an amplifier. (7 marks)

(b) What is the effect of cascading on gain, frequency response and bandwidth ? (8 marks)

Or

(c) State and explain Miller effect. (7 marks)

(d) Explain the concept of current source biasing. (8 marks)

[4 × 15 = 60 marks]