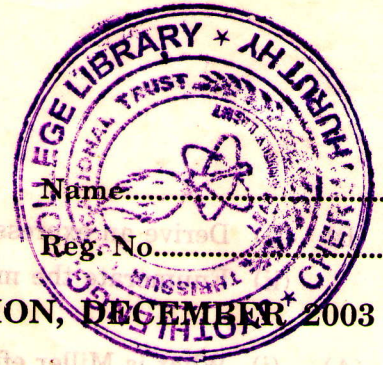D 30342

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THIRD SEMESTER B.TECH. DEGREE EXAMINATION, DECEMBER 2003

## EE.2K. 304. ELECTRONICS—I

Time : Three Hours

Maximum : 100 Marks

*Answer **all** the questions.*

I. (a) Distinguish the Electrical properties of Silicon from germanium.

(b) Explain how a PN junction diode can be used as an electronic switch.

(c) What is d.c. load line ? Explain how Q-point is fixed on d.c. load line.

(d) Write clamping circuit theorem. Enumerate its applications in Communication Engineering.

(e) What is thermal runaway ? What are methods to combat thermal runaway ? Explain.

(f) Distinguish class B from class AB operation.

(g) Define and explain :

    (i) Gain.

    (ii) Bandwidth.

    (iii) Frequency response.

(h) Define and explain Gain bandwidth product of an amplifier.

(8 × 5 = 40 marks)

II. (A) (i) Show the potential variations within step and graded semiconductors.

    (ii) Explain how a P-N junction can be used as a rectifier.

(8 + 7 = 15 marks)

Or

(B) Distinguish JFET from BJT. Explain the construction and characteristics of JFET with neat diagrams. Derive the relationship among FET parameters.

(15 marks)

III. (A) (i) Write a note on a.c. load line.

    (ii) Compare and contrast the parameters of full wave centre-tapped rectifier from bridge rectifier.

(8 + 7 = 15 marks)

Or

(B) What are the types of limiters ? Explain the operation of each type in detail.

(15 marks)

IV. (A) (i) What is fixed bias ? Explain. Derive the Q-point parameters for a fixed bias circuit.

    (ii) Bring out the advantages of *h*-parameter model of a BJT.

(8 + 7 = 15 marks)

Or

Turn over
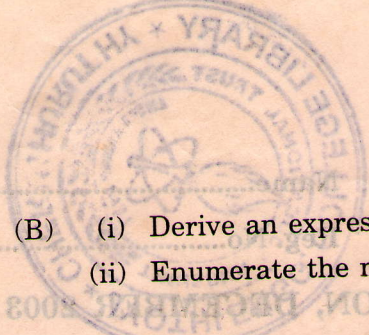
(B) (i) Derive an expression for the voltage gain of a common source FET amplifier.

    (ii) Enumerate the methods of biasing JFET.

(8 + 7 = 15 marks)

V. (A) (i) What is Miller effect ? Give the advantages and applications of this effect. Show the application of this effect using an example.

    (ii) Derive the parameters of Emitter follower at high frequencies.

(8 + 7 = 15 marks)

Or

(B) (i) Enumerate the importance of CMRR for a differential amplifier.

    (ii) Explain the types of differential amplifier.

(8 + 7 = 15 marks)

[4 × 15 = 60 marks]