G 211

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2003.

Fourth Semester

Computer Science and Engineering

EC 250 — ELECTRONIC CIRCUITS

Time : Three hours   Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Draw the energy band diagram of a semiconductor.

2. Name the different operating regions of a transistor.

3. List the classification of –ve feed back amplifiers.

4. Why an NPN transistor has a better high frequency response than a PNP transistor?

5. What is an OPAMP?

6. Draw the output waveforms of an ideal differentiator when the input is (a) step and (b) square wave.

7. What is the function of commutating capacitance in multivibrators?

8. Compare an amplifier with an oscillator.

9. Draw the first order low pass Butterworth filter.

10. Using op amp draw a sample and hold circuit.

PART B — (5 × 16 = 80 marks)

11. Explain the low frequency operation of a CE amplifier and also discuss the effect of coupling and bypass capacitors.   (16)

12. (a) (i) Discuss the operation of a PN junction diode and also explain its VI characteristics. (12)

(ii) Compare FET with BJT. (4)

Or

(b) (i) Explain the operation of JFET. (8)

(ii) Briefly explain the intrinsic and extrinsic semiconductors. (8)

13. (a) Briefly describe the operation of inverting and non–inverting amplifiers. (16)

Or

(b) (i) Describe the op amp parameters. (8)

(ii) Explain the following op amp configurations : (8)
(1) Voltage follower.
(2) Integrator.

14. (a) (i) Draw the functional diagram of 555 timer and explain its operation. (8)

(ii) Design a symmetrical astable multivibrator at a frequency of 1 kHz with an amp 10 V, $h_{fc} = 50$, $I_{csat} = 5$ mA, $V_{CEsat} = 0$. (8)

Or

(b) Discuss the operation of RC phase shift oscillator and derive the conditions for oscillations and frequency of oscillation. (16)

15. (a) (i) Design a first order low pass Butterworth filter with a cutoff frequency of 15.9 kHz and with a passband gain of 1.5. (8)

(ii) Write notes on :
(1) Active filters. (4)
(2) Demultiplexer. (4)

Or

(b) (i) Discuss the operation of the counter type A/D converter with an example. (12)

(ii) Describe the operation of an analog multiplier. (4)

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