S 9179

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2006.

Second Semester

Information Technology

IF 141 – ELECTRONIC DEVICES AND CIRCUITS

Time : Three hours
Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Why FET is called voltage controlled device?

2. What is meant by reverse leakage current in a diode?

3. Draw the dc load line for a CE amplifier with fixed bias.

4. What is a tuned amplifier? How it is classified.

5. Name the different types of feedback amplifier.

6. What are the conditions to be satisfied for producing sustained oscillations in an oscillator?

7. Draw the diagram of mono-stable multivibrator constructed using transistors.

8. In a mono-stable multivibrator constructed using IC 555, find the duration of quasi stable state if the value of R is 1 KΩ and C is 10 μf.

9. Draw the circuit of non-inverting amplifier using op-amp and write expression for gain in it.

10. Write the characteristics of ideal op-amp.

PART B — (5 × 16 = 80 marks)

11. (a) Explain the input and output characteristics of BJT in common emitter configuration. How the input impedance and current gain of BJT are calculated from the above characteristics? (16)

Or

(b) Explain the construction, working principle and V–I characteristics of SCR. (16)

12. (a) (i) Derive the expression for I_{BQ}, I_{CQ} and V_{CEQ} in a BJT–CE amplifier with voltage divider bias. (8)

(ii) Explain the working principle of Class B push pull amplifier with neat diagram. (8)

Or

(b) (i) Derive the expression for input impedance, voltage gain and current gain in a common base amplifier. Assume $h_{rb} = h_{ob} \cong 0$. (8)

(ii) Explain the working principle of double tuned amplifier with its frequency response curve. (8)

13. (a) (i) Explain the effect of negative feedback on gain stability and distortion in a feedback amplifier. (8)

(ii) Describe current series feedback amplifier with an example. (8)

Or

(b) (i) The voltage gain and bandwidth of a certain amplifier without feedback is 300 and 200 kHz respectively. If the feedback factor (B) is equal to 0.1, find the voltage gain and bandwidth of the amplifier with negative feedback. (8)

(ii) Explain the working principle of RC phase shift oscillator. (8)

14. (a) Explain the construction and working principle of bistable multivibrator with necessary circuit and waveforms. (16)

Or

(b) Describe the working principle of astable multivibrator constructed using IC 555 with necessary circuit diagram and waveforms. Derive the expression for frequency of output square wave init. (16)

15. (a) Explain the construction of differentiator circuit and current to voltage converter using op-amp and describe their operation by deriving necessary equations. (16)

Or

(b) (i) Explain the construction of adder and subtracter circuit using op-amp and describe their operation. (8)

(ii) Draw the circuit of second order low pass active filter and describe its frequency response characteristics. (8)

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2

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