

N 1165

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2004.

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. What is meant by cut in or threshold voltage in a forward biased diode? What is its value for Ge diode?
2. What is meant by holding current in SCR?
3. What are the factors responsible for shifting of Q-point in an amplifier?
4. Define efficiency of a power amplifier.
5. Write any four advantages of negative feedback employed in amplifier.
6. What is meant by Bistable multivibrator?
7. State Barkhausen criterion for sustained oscillation.
8. When a 555 timer is configured in astable mode, what is the minimum and maximum voltage across the capacitor in terms of supply voltage (V_{cc})?
9. Write down the characteristics of ideal operational amplifier.
10. Draw the circuit of current to voltage converter using op-amp.

PART B — (5 × 16 = 80 marks)

11. (i) Derive the expression for input resistance and output resistance of an amplifier with voltage series negative feedback connection. (16)
- (ii) Explain the working principle of Hartley oscillator. Write the expression for frequency of oscillation in it. (6)

12. (a) (i) Explain the construction, working principle and characteristics of a p-channel JFET. (16)
- (ii) Write down the different FET parameters. (6)

Or

- (b) Describe the construction and working principle of SCR. Also draw its V-I characteristics. (16)

13. (a) (i) Derive the expression for finding the quiescent value of base current, collector current and collector to emitter voltage (V_{CE}) in a common emitter amplifier with self bias. (10)
- (ii) How power amplifiers are classified? Explain. (6)

Or

- (b) (i) With neat circuit diagram, explain the working principle of class B push-pull amplifier. Obtain the maximum value of conversion efficiency in it. (10)
- (ii) What is meant by tuned amplifier? How it is classified? (6)

14. (a) Draw the circuit diagram of differentiator and integrator constructed using operational amplifier and explain their operation. (16)

Or

- (b) (i) Draw the circuit diagram of second order Butterworth low pass filter and explain its operation with frequency response characteristics. (10)
- (ii) Describe the operation of voltage to current converter using operational amplifier. (6)

15. (a) With neat sketch, explain the working principle of astable multivibrator constructed using transistors. Also derive the expression for frequency of output square wave. (16)

Or

- (b) (i) Draw the internal block diagram of 555 timer and explain the function of different components in it. (10)
- (ii) Explain the working principle of astable multivibrator constructed using 555 timer with necessary waveforms. (6)
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