

Reg. No. :

**Question Paper Code : 50491**

B.E./B.Tech. DEGREE EXAMINATIONS, APRIL/MAY 2023.

Fourth Semester

Electronics and Communication Engineering

EC 8452 — ELECTRONIC CIRCUITS — II

(Common to Electronics and Telecommunication Engineering)

(Regulations 2017)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Draw the equivalent circuit of a transconductance amplifier.
2. What would happen to the gain-bandwidth product of an amplifier when a negative feedback is introduced?
3. Why is no phase shift necessary in feedback of a Wein bridge oscillator?
4. For a crystal with  $L=0.4$  H,  $C=0.085$  pF,  $C_M=1$  pF and  $R = 5$  KOhms, calculate the parallel resonant frequency.
5. What is meant by loaded Q and unloaded Q?
6. Write short notes on coil losses.
7. Draw the response of a high pass RC circuit for a square input.
8. What is the function of a commutating capacitor in bistable multivibrator?
9. When will power dissipation be maximum in a class A power amplifier?
10. Compare Class C and Class AB amplifiers.

PART B — (5 × 13 = 65 marks)

11. (a) Derive the expression for output resistance of a current series and current shunt feedback amplifier, and analyze the impact of feedback in the output resistance of the circuit.

Or

- (b) Determine the voltage gain, input and output impedance with feedback for a voltage series feedback having  $A = -100$ ,  $R_i = 10 \text{ k}\Omega$ ,  $R_o = 20 \text{ k}\Omega$  for feedback of

(i)  $\beta = -0.1$  (4)

(ii)  $\beta = -0.5$  (4)

(iii) Analyze the impact of increasing the feedback factor. (5)

12. (a) Draw the circuit diagram of a RC phase shift oscillator and derive the expression for frequency of oscillation.

Or

- (b) Draw the circuit diagram of a Hartley oscillator and derive the expression for frequency of oscillation.

13. (a) Explain any three neutralization techniques used in tuned amplifiers.

Or

- (b) Draw the circuit of a single tuned amplifier and analyze the circuit in terms of gain and bandwidth.

14. (a) Draw the circuit diagram and the input-output waveforms for the following circuits considering the diode to be ideal.

(i) Series positive clipper to clip above a particular reference voltage. (4)

(ii) Shunt negative clipper (4)

(iii) Positive clamper. (5)

Or

- (b) Illustrate the working of schmitt trigger.

15. (a) Discuss in detail push pull and class B amplifier and derive its expression for DC input power, AC output power, efficiency, and power dissipation.

Or

- (b) Explain the working of a buck boost converter.

PART C — (1 × 15 = 15 marks)

16. (a) An amplifier without feedback gives an output of 50V with 6% second harmonic distortion when the input is 0.2V. If the negative feedback is applied to amplifier so that the second harmonic distortion is reduced to 1%,

(i) What value of feedback must be used? (7)

(ii) What is the input voltage required to produce the same output voltage of 50 V. (8)

Or

- (b) Design a astable multivibrator to produce an asymmetrical square wave with  $T_a = 0.5 \text{ msec}$  and  $T_b = 0.4 \text{ msec}$ . Assume input voltage = 15V,  $h_{fe(\min)} = 20$ ,  $I_{Csat} = 5 \text{ mA}$ ,  $V_{CEsat} = 0$ . Neglect capacitor current.