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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=1pF 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 $A = -100$, $R_i = 10\ k\Omega$, $R_o = 20\ k\Omega$ for feed back 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 msec and T_b = 0.4 msec. Assume input voltage =15V, $h_{fe(min)}$ = 20, I_{Csat}=5mA, V_{CEsat} = 0. Neglect capacitor current.

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