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Question Paper Code : 10533

B.E./B.Tech. DEGREE EXAMINATIONS, APRIL/MAY 2025.

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. How does negative feedback influence the gain and noise of an amplifier?
2. What is the influence of positive feedback and negative feedback in amplifiers?
3. When will an amplifier function as an oscillator?
4. Which factors affect the frequency stability of an oscillator?
5. How does Q factor determine the bandwidth and selectivity in tuned amplifiers?
6. What is the effect of cascading tuned amplifiers on bandwidth?
7. How is a low pass RC circuit used as an integrator?
8. How is a Schmitt Trigger different from a multivibrator?
9. Under what conditions does a sinusoidal input to an amplifier provide a sinusoidal output without distortion?
10. Why are power transistors provided with heat sinks?

PART B — ($5 \times 13 = 65$ marks)

11. (a) In a negative feedback amplifier, open loop gain is given by 100, feedback ratio is given by 0.04 and input voltage is given by 50 mV. Find the following terms
- (i) gain with feedback (4)
 - (ii) output voltage (4)
 - (iii) feedback factor and voltage (5)

Or

- (b) A voltage series negative feedback amplifier has a voltage gain without feedback of $A = 500$, input resistance $R_i = 3 \text{ k}\Omega$, output resistance of 20 K and feedback ratio of 0.01.
- (i) Calculate the voltage gain with feedback, input resistance R_{if} , output R_{of} of the amplifier with feedback. (10)
 - (ii) Justify as to which transistor configuration uses voltage series feedback. (3)
12. (a) (i) How is an amplifier converted into an oscillator with a RC feedback network providing 180-degree phase shift and what is the resulting frequency of oscillation. (10)
- (ii) What is the condition for sustained an oscillator? (3)

Or

- (b) How does the crystal's high Q factor, equivalent circuit parameters and external circuit components affect frequency stability for high precision applications?
13. (a) Why is stagger tuned amplifier preferred over double tuned amplifier? Explain by using its characteristics, gain and bandwidth.

Or

- (b) Explain how neutralization technique applied in tuned RF amplifiers to maintain stability?
14. (a) In a transistorized astable multivibrator, $R_{C1} = R_{C2} = 2\text{k}$, $R_1 = R_2 = 50 \text{ K}$ and $C_1 = C_2 = 0.01 \mu\text{F}$. Draw the circuit and find the frequency of the square wave generated.

Or

- (b) Design a Schmitt Trigger with $V_{CC} = 12\text{V}$, $U_{TP} = 5\text{V}$, $L_{TP} = 3\text{V}$, and $I_C = 2\text{mA}$ using two silicon NPN transistors with $h_{FF(\min)} = 100$.

15. (a) Explain in detail how cross over distortion in Class B amplifiers could be eliminated by using push pull amplifiers.

Or

- (b) Explain the working principles of buck-boost converter with an application.

PART C — ($1 \times 15 = 15$ marks)

16. (a) Explain using suitable circuits as to how a PN junction diode can function as a clipper, waveshaper, comparator and as a rectifier?

Or

- (b) Explain using suitable circuit as to how positive feedback and negative feedback affects the stability, bandwidth and gain of an amplifier.

