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Question Paper Code : 70513

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 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. How does negative feedback affect the stability of an amplifier circuit?

2. A feedback amplifier has an open loop gain of 500 and a feedback factor of $\beta = 0.02$. Find the closed loop gain of the circuit when a negative feedback is introduced.

3. Why are RC oscillators preferred for the generation of low frequencies?

4. Draw the circuit of a Hartley oscillator.

5. Define Q factor.

6. Determine the bandwidth of a 3 stage cascaded single tuned amplifier if its resonant frequency is 400 KHZ and the loaded Q of each stage is 10.

7. Write the output equation and draw the output waveform of the given circuit (Figure. 7) if the input is $V_i = V_m \sin \omega t$.

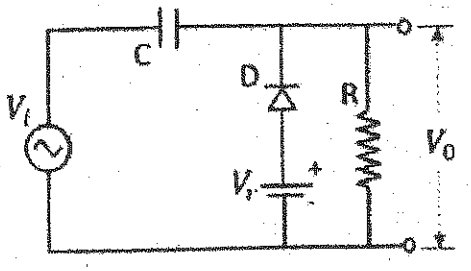

Figure. 7

8. Give two applications of Schmitt trigger.

9. Differentiate power amplifiers from voltage amplifiers.

10. Distinguish between class A, class B, and Class C amplifiers.

PART B — (5 × 13 = 65 marks)

11. (a) Discuss of the effect of negative feedback on the frequency response of an amplifier with necessary diagrams and derivations.

Or

(b) Derive the expression for gain, input resistance and output resistance of a voltage series and a current shunt feedback amplifiers.

12. (a) Derive the transfer functional a phase lead-lag network and hence obtain the frequency of oscillation of a Wein bridge oscillator.

Or

(b) (i) A quartz crystal has L = 3 H, C = 0.01 pF and R = 2KΩ. Its mounting capacitance is 2 pF. Calculate its series and parallel resonance. (8)

(ii) How is amplitude stabilization achieved in an oscillator circuit? (5)

13. (a) What is a stagger tuned amplifier? Explain its operation.

Or

(b) What is neutralization? Why is it required in tuned amplifiers? Explain Hazeltine neutralization technique with neat diagram.

14. (a) What is a multivibrator? How is it different from an oscillator? Explain the operation an astable multivibrator.

Or

(b) Explain the operation of a UJT oscillator.

15. (a) Illustrate the working and characteristics of a power MOSFET.

Or

(b) Demonstrate the operation of a Busk-Boost converter.

PART C — (1 × 15 = 15 marks)

16. (a) Analyze the given circuit (Figure. 16(a)) and find its voltage gain, input and output resistance if its transistor parameters are $h_{ie} = 1\,k$, $h_{fe} = 100$, $h_{re} = 0$.

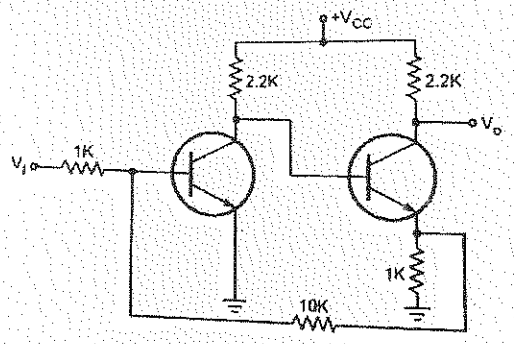

Figure. 16(a)

Or

(b) Design a single tuned amplifier, to have a center frequency of 500 KHz and a bandwidth of 10 KHz. The transistor parameters are $g_m = 0.04\,S$, $h_{fe} = 100$, $C_{be} = 1000\,pF$, $C_{bc} = 100\,pF$. The bias network and the input resistance are adjusted so that $r_i = 4K\,\Omega$, and $R_L = 00\ \Omega$.