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Question Paper Code : 40445

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2021.

Fourth Semester

Electronics and Communication Engineering

EC 8452 – ELECTRONIC CIRCUITS – II

(Common to Electronics and Telecommunication Engineering)

(Regulations 2017)

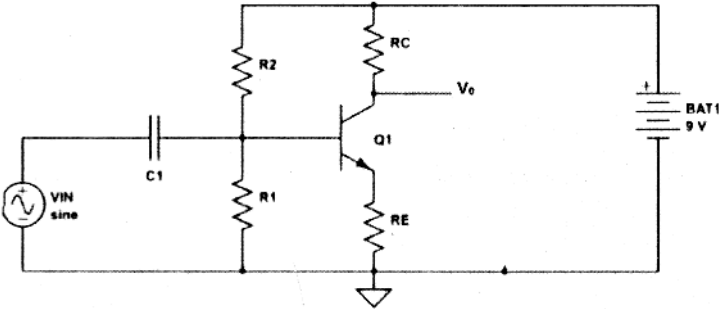
Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

- 1. What is the effect of negative feedback on the input and output impedance of a voltage series and current series amplifier?
- 2. Identify the topology of the amplifier given in the circuit.



- 3. State the condition for oscillation.
- 4. What is a tank circuit? How does it work?
- 5. An inductor of 250 μH has Q = 300 at 1 MHz. Determine the resistor that has to be connected in series to the inductor.
- 6. How is a double tuned amplifier different from a single tuned amplifier?
- 7. How is a damper different from a clipper?

8. Differentiate an oscillator from a multivibrator.
9. Where do you find the Q-portal for the class A Power Amp.
10. Draw the circuit of a DC/DC converter.

PART B — (5 × 13 = 65 marks)

11. (a) A single stage RC coupled amplifier has a midband gain of 500. It is made into a negative feedback amplifier by feeding 20% of the output in series with input.
 - (i) What is the ratio of half power frequencies with feedback to those without feedback?
 - (ii) If a lower cut off frequency is 20 Hz and higher cut off frequency is 50 KHz is required for the amplifier with feedback, what should be its values for the amplifier without feedback.

Or

- (b) If an amplifier has a bandwidth of 300 KHz and voltage gain of 100, and if 10% negative feedback is introduced,
 - (i) What will be the new bandwidth and gain?
 - (ii) What will be the gain bandwidth product before and after feedback?
 - (iii) What should be the amount of feedback if the band width is to be limited to 800 KHz.
12. (a) With a neat circuit, explain the operation of a RC phase shift oscillator and derive the expression for its frequency of oscillation.

Or

- (b) A crystal $L = 0.4$ H, $C = 0.085$ pF and $C_M = 1$ pF with $R = 5$ K Ω , find :
 - (i) Series resonant frequency
 - (ii) Parallel resonant frequency
 - (iii) By what percent does the parallel resonant frequency exceed the series resonant frequency?
 - (iv) Find the Q factor of the crystal.
13. (a) What are staggered tuned amplifier? Explain the circuit operation.

Or

- (b) Explain the technique by which both stability and circuit performance can be ensured in a tuned amplifier.

14. (a) Explain the operation of a stable multivibrator with neat circuit diagram.

Or

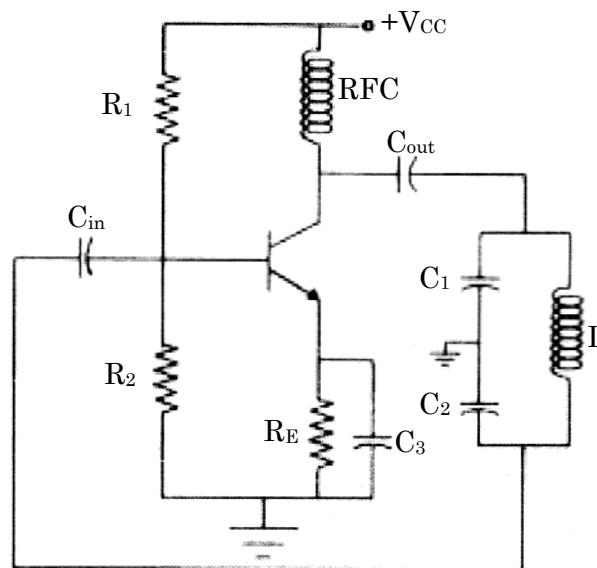
- (b) What is a Schmitt trigger? How does it work? List its applications.
15. (a) Explain the different types of power amplifiers and their significance. Derive efficiency of Class A power amplifier.

Or

- (b) Explain the operation of a Buck-Boost converter and List its applications.

PART C — (1 × 15 = 15 marks)

16. (a) The circuit shown below has $R_1 = 10 \text{ k}\Omega$, $R_2 = 5 \text{ k}\Omega$, $L = 5 \text{ }\mu\text{H}$,
 $C_1 = C_2 = 0.001 \text{ }\mu\text{F}$.
- (i) Calculate the frequency of oscillation of this circuit
- (ii) If a 63 pF capacitor is connected in series with the inductor in this circuit, what would be the frequency of oscillation.



Or

- (b) The circuit parameters of a fixed bias bistable multivibrator are $V_{CC} = V_{BB} = 5\text{V}$, $R_C = 1 \text{ k}\Omega$, $R_1 = 5 \text{ k}\Omega$, $R_2 = 25 \text{ k}\Omega$. The NPN silicon transistor has $h_{fe(\text{min})} = 20$. Calculate stable state currents and voltages assuming all junction voltages to be zero.