

Roll No.

Total No. of Questions : 09]

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[Total No. of Pages : 02

Paper ID [EC202]

(Please fill this Paper ID in OMR Sheet)

B.Tech. (Sem. - 4th)

ANALOG ELECTRONICS (EC - 202)

Time : 03 Hours

Maximum Marks : 60

Instruction to Candidates:

- 1) Section - A is **Compulsory**.
- 2) Attempt any **Four** questions from Section - B.
- 3) Attempt any **Two** questions from Section - C.

Section - A

Q1)

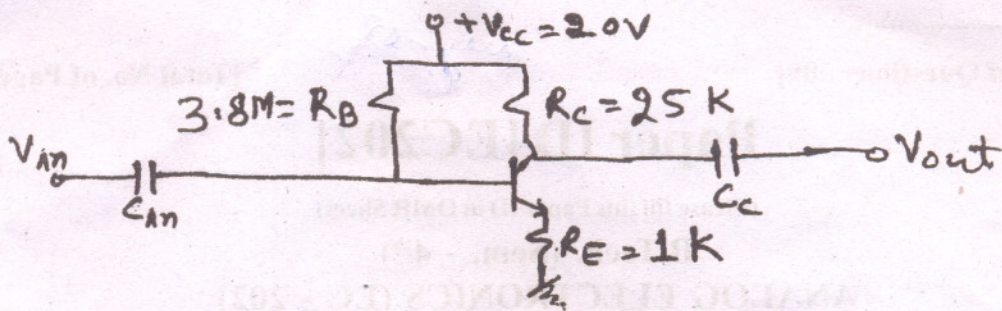
(10 × 2 = 20)

- a) What are the Physical origins of resistances in hybrid-pi model of CE Transistor Amplifier at high frequencies?
- b) What is an Oscillator? How does it differ from an Alternator?
- c) Which configuration of Bipolar Transistor is called as Emitter follower & why, for what purpose it is used?
- d) What are the advantages of Complimentary Symmetry Amplifier?
- e) What is the advantage of Stagger tuned Amplifier?
- f) What are the different types of configurations used in multistage amplifier circuits?
- g) What is the use of Bleeder in Zener Voltage Regulator?
- h) What are the Barkhusain conditions of oscillations in electronic systems? What is their significance?
- i) Define T model of a Bipolar Transistor.
- j) Define Line & Load Regulation.

Section - B

(4 × 5 = 20)

- Q2) Find (a) feedback ratio (b) feedback factor (c) voltage gain without feedback (d) voltage gain with feedback for a circuit given below. Assume transistor $\beta = 200$ and neglect V_{be} .



- Q3) A CE connected amplifier has $C_{cb} = 5\text{pF}$, $C_{be} = 12\text{pF}$, $h_{fe} = 100$, $h_{ie} = 1.5\text{k}\Omega$. Find the input capacitance to the circuit for a circuit collector resistance of $12\text{k}\Omega$.
- Q4) Explain how device Capacitances plays dominant role in CE Amplifier in high frequency region.
- Q5) What are the different types of $-ve$ feedback? Explain each with block diagram.
- Q6) Draw and explain the working of push pull class-A Amplifier. What are its advantages & disadvantages?

Section - C

(2 × 10 = 20)

- Q7) In a Transistor Colpitt's oscillator we have $L = 100\mu\text{H}$, $L_{RFC} = 0.6\text{mH}$, $C_1 = 0.001\mu\text{F}$, $C_2 = 10\mu\text{F}$. Find (a) operating frequency (b) feedback fraction (c) minimum gain to sustain oscillations & Emitter Resistance if $R_c = 2.5\text{k}\Omega$.
- Q8) Draw and explain the working of R-C phase shift oscillator and also derive an expression for its frequency of oscillations.
- Q9) Write a note on following :
- Miller Effect.
 - Transistor series Regulators.

