Analog Electronics
(EC-202, Dec-07)

Note: Section A is compulsory. Attempt any four questions from section-B and any two from Section-C.

Section-A

1. a) Define model of a bipolar Transistor.
   b) What is an oscillator? How does it differ from an amplifier?
   c) Which configuration of bipolar transistor is called as emitter follower & why, for what purpose is it used?
   d) What is the use of bleeder in zener voltage regulator?
   e) What are the different types of configuration used in multistage amplifier circuits?
   f) What is the advantage of Stagger tuned Amplifier?
   g) What is the Miller effect?
   h) What are the Barkhusain conditions of oscillations in electronic systems? What is their significance?
   i) What are the physical origins of resistances in hybrid-pi model of CE Transistor Amplifier at high frequencies?
   j) Define Line & Load Regulation.

Section-B

2. What are the different types of –ve feedback? Explain each with block diagram.
3. Draw and explain the working of push pull class-B Amplifier. What are its advantages and disadvantages?
4. A CE connected amplifier has C_{cb} = 5 pF, C_{be} = 12 pF, h_{fe} = 100, h_{ie} = 1.5 kΩ. Find the input capacitance to the circuit for a circuit collector resistance of 12 kΩ.
5. Find (a) feedback ratio (b) feedback factor (c) Voltage gain without feedback (d) voltage gain with feedback for a circuit given below. Assume transistor β = 200 and neglect V_{be}.
6. Explain how device Capacitance plays dominant role in CE Amplifier in high frequency region.

Section-C

7. Draw and explain the working of R-C phase shift oscillator and also derive an expression for its frequency of oscillations.
8. In a transistor Colpitt's oscillator we have L = 100 μ H, L_{RFC} = 0.6 mH, C_1 = 0.001 μ F, C_2 = 10 μ F. Find (a) operating frequency (b) feedback fraction (c) minimum gain to sustain oscillations & Emitter Resistance if R_C=2.5 Kω.
9. Write a note on following:
   (a) Complimentary symmetry amplifier.
   (b) Transistor series Regulators.