

II B.Tech I Semester(R05) Supplementary Examinations, May/June 2010
ELECTRONIC CIRCUIT ANALYSIS
(Electronics & Communication Engineering)

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. (a) With the help of necessary equations, discuss the variation of A_I , A_V , R_i , and R_o with R_S and R_L in Common Emitter configuration.
- (b) For a CE configuration, what is the maximum value of R_S for which R_o differs by no more than 10 percent of its value for $R_S = 0$. The h-parameter values are $h_{fe} = 50$, $h_{ie} = 1.1\text{K}\Omega$, $h_{re} = 2.5 \times 10^{-4}$, $h_{oe} = 25 \mu\text{A/V}$. [10+6]
2. (a) Draw the circuit diagram of Darlington emitter follower and derive expressions for current gain and input impedance. List the important characteristics of it.
- (b) If six identical amplifiers are cascaded each having $f_H = 100 \text{ KHz}$, determine the overall f_H . Assume non interacting stages.
- (c) Write a short note on Gain-Bandwidth product of amplifiers. [8+4+4]
3. (a) Draw the Hybrid - π model of a transistor in CE configuration and give the typical values of these parameters.
- (b) Draw the small-signal equivalent circuit for an emitter-follower stage at high frequencies. Find its value of input admittance. [6+10]
4. (a) What are the advantages and disadvantages of push pull configuration? Show that in Class-B push pull amplifier the maximum conversion efficiency is 78.5% [8]
- (b) A transistor in a transformer coupled (Class - A) power amplifier has to deliver a maximum of 5 Watts to a load of 4Ω load. The quiescent point is adjusted for symmetrical swing, and the collector supply voltage is $V_{CC} = 20 \text{ Volts}$. Assume $V_{min} = 0 \text{ volts}$.
 - i. What is the transformer turns ratio?
 - ii. What is the peak collector current? [8]
5. (a) Explain what happens to the gain because of the presence of feedback capacitance from collector to base in single tuned BJT amplifier circuit?
- (b) Explain in detail the Unilateralisation technique with the help of circuit diagram?
- (c) Explain the difference between Neutralization and Unilateralisation techniques? [4+8+4]
6. Explain the reasons for oscillations in a tuned amplifier. Briefly explain the methods used to stabilize the tuned amplifiers against oscillations? [16]
7. (a) Explain why voltage regulators are called as closed loop control systems?
- (b) A power Supply having output resistance of 2 ohms supplies a full-load current of 100mA to a 50 ohms load. Find the percent voltage regulation and no-load output voltage of the supply?
- (c) Draw and explain the load voltage and load current characteristic for a current limited regulator. [4+6+6]
8. (a) What is catcher diode and explain the necessity of catches diode in Switch Regulator with the help of circuit diagram.
- (b) List the operating ratings and electrical characteristics of IC 723. [8+8]
