

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]
