

II B.Tech I Semester(R07) 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) Derive the expressions for A_i , A_V of CE amplifier circuit. Explain how A_i and A_V are effected by R_L .
(b) Consider a single stage CE amplifier with $R_S = 1K$, $R_1 = 50 K$, $R_2 = 2 K$, $R_C = 1K$, $R_L = 1.2K$, $h_{fe} = 50$, $h_{ie} = 1.1K$, $h_{re} = h_{oe} = 0$; Find A_I , R_i , R_o , A_V and power gain. [8+8]
2. (a) Discuss about different types of distortions that occur in amplifier circuits
(b) Three identical non interacting amplifier stages in cascade have an overall gain of 1 dB down at 30 Hz compared to mid band. Calculate the lower cutoff frequency of the individual stages. [8+8]
3. (a) What is the physical origin of the two capacitors in the Hybrid - π model? What is the order of magnitude of each capacitance?
(b) Define f_T and what is physical significance of f_T ? If silicon p-n-p transistor has $f_T = 400MHz$. What is the base thickness? [Assume Diffusion constant as $13cm^2/sec$]. [10+6]
4. (a) Define the conversion efficiency of a power amplifier. A class B power amplifier with a direct coupled load has a collector efficiency of 15% and delivers a power output of 5 Watts. Find
i. The DC power input
ii. Power dissipation at maximum output [6]
(b) Draw the push-pull power amplifier circuit. Derive the expression for the output current in push pull amplifier with base current as $i_b = I_{bn} \sin \omega t$. [10]
5. (a) Explain the differences between the function of a transformer used in a Power amplifier and that used in a double tuned voltage amplifier?
(b) State at least one electronic system where the tuned voltage amplifier is Used. Also state its function in that system. [8+8]
6. Explain as to how you can increase the selectivity of single tuned amplifier. Draw the circuit diagram and explain its operation and also draw its frequency response? [16]
7. (a) Explain why voltage regulators are required for a DC power supply operating from an AC source?
(b) A power supply has a voltage regulation of 1% If the no load voltage is 30V What is the full load voltage?
(c) Give the differences between Load and Line Regulations. [6+4+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]
