

II B.Tech I Semester Regular Examinations, November 2007
ELECTRONIC CIRCUIT ANALYSIS
 (Common to Electronics & Communication Engineering and Electronics & Telematics)

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 two-stage amplifier circuit (CE-CC configuration) is shown in figure 2. The h-parameter values are $h_{fe} = 50$, $h_{ie} = 2\text{K}\Omega$, $h_{re} = 6 \times 10^{-4}$, $h_{oe} = 25 \mu\text{A/V}$, $h_{fc} = -51$, $h_{ic} = 2\text{K}\Omega$, $h_{rc} = 1$, $h_{oc} = 25 \mu\text{A/V}$. Find the input and output impedances and individual, as well as overall voltage and current gains.

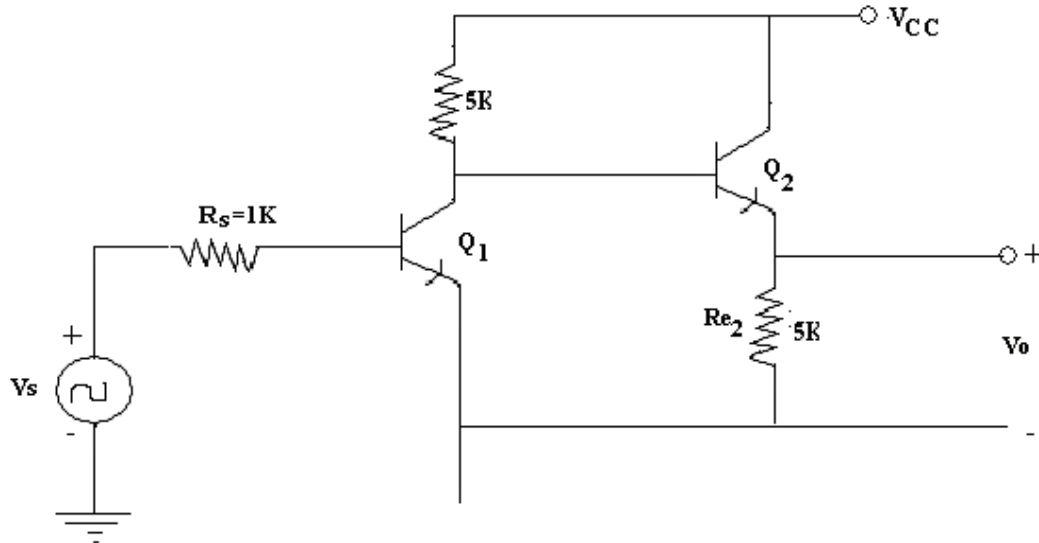


Figure 2

3. (a) Draw Hybrid - π model for a transistor in the CE configuration and explain the significance of every component in this model.
 (b) Given a germanium p-n-p transistor whose basewidth is 10^{-4} cm . At room temperature and for a dc emitter current of 2 mA, find
 - i. emitter diffusion capacitance,
 - ii. f_T [Assume Diffusion constant as $47\text{ cm}^2/\text{sec}$].

[8+8]

4. (a) In series fed Class - A power amplifier, explain the importance of the position of operating point on output signal swing. Show that the conversion efficiency is 25%.
(b) Discuss the origin of various distortions in transistor amplifier circuits. [10+6]
5. Draw the circuit diagram of a Double tuned amplifier and derive the expression for 3-dB bandwidth. [16]
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]

★ ★ ★ ★ ★