Code: R7210406 **R07**

B.Tech II Year I Semester (R07) Supplementary Examinations December 2015

ELECTRONIC CIRCUIT ANALYSIS

(Electronics & Communication Engineering)

(For 2008 regular admitted batch only)

Time: 3 hours Max. Marks: 80

Answer any FIVE questions

All questions carry equal marks

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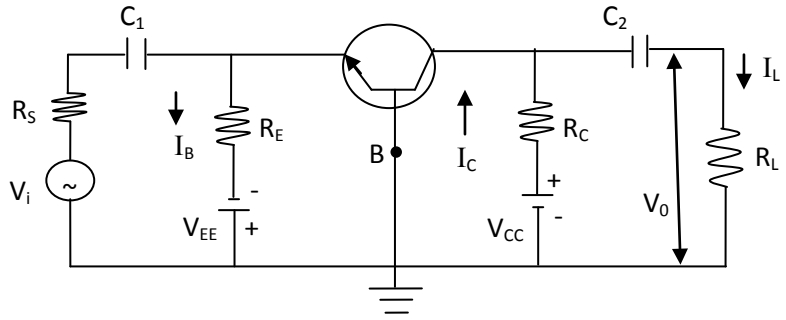
1 (a) Explain the principle of operation of basic CE amplifier circuit. Give important characteristics of CE amplifier.

(b) Calculate A_i, R_i, A_V and R_0 for C-B amplifier shown below, with R_L = 5 kΩ, R_S = 500 Ω, h_{fe} = 50; h_{ie} = 1 kΩ, h_{oe} = 50 kΩ and R_E = 10 kΩ and R_e = 10 kΩ.



2 (a) When two-stage of identical amplifiers are cascaded, obtain the expressions for overall voltage gain, current gain and power gain.

(b) For a given transistor (BJT) H_{fe} = 100, f_B = 5 kHz. Determine the bandwidth of the transistor. If the lower cut-off frequency f_1 = 100 MHz and uppercut off frequency f_2 = 100 kHz, then determine the mid-band frequency f_0 of the amplifier circuit.

3 (a) Draw the small-signal equivalent circuit for an emitter-follower stage at high frequencies. Find its value of input admittance.

(b) Given a germanium p-n-p transistor whose base width is 10^{-4} cm. At room temperature and for a DC emitter current of 2mA. Find: (i) Emitter diffusion capacitance. (ii) f_T (Assume diffusion constant as 47 cm^2/sec). What is the use of calculating noise figure?

4 (a) Explain why a power amplifier is always preceded by a voltage amplifier.

(b) Explain the phenomenon of crossover distortion' that pops up in complementary symmetry push-pull amplifier circuit for class-B operation. Explain with necessary diagrams, how 'trickle bias' overcome the above problem.

5 (a) Draw a simple BJT tuned amplifier circuit and its ideal response characteristics.

(b) Explain the principle of stager tuning technique of transformer-coupled amplifier that is used to obtain band pass filter characteristics with pass band of 10 kHz with all necessary diagrams for illustration.

6 Explain in detail the effect of cascading tuned amplifiers and hence derive the expression for bandwidth of n-stage amplifier. Also draw the frequency response and explain what happens as the number of stages increases.

7 (a) Draw the circuit of a series regulator circuit to stabilize the DC output voltage and explain the design methodology.

(b) Give the circuit of a short circuit overload protection that is to be provided in a voltage regulator circuit and explain its working.

8 (a) Draw the circuit for 7805 voltage regulator along with unregulated power supply and explain its working.

(b) Draw the circuit diagrams of voltage doubler and voltage tripler circuits and explain their working. Explain in detail about Shannon Coding theorem.

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