Code: 9A04402

R09

B.Tech II Year II Semester (R09) Supplementary Examinations December/January 2014/2015

ELECTRONIC CIRCUIT ANALYSIS

(Common to EIE, E.Con.E & ECE)

Time: 3 hours Max. Marks: 70

Answer any FIVE questions
All questions carry equal marks

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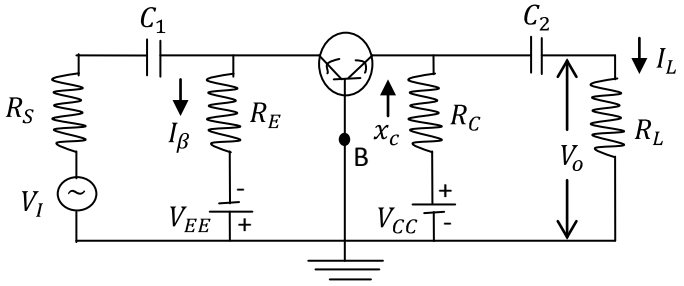
1 (a) Explain the classification of amplifiers based on frequency range, type of coupling, power delivered and signal handled.

(b) Derive the expression for A_i, R_i, A_v and R_o of CB amplifier circuit shown below.



2 (a) Explain different methods used for coupling multistage amplifiers with their frequency response.

(b) Five identical stages are coupled, each amplifier having f_2 = 100 KHz. Determine the overall upper cut-off frequency for the five stages.

3 (a) Draw the hybrid π - equivalent circuit of BJT and explain the significance of each parameter. Mention typical values of hybrid π - parameters.

(b) Given the following transistor measurements made at I_C = 5 mA, V_{CE} = 10 V and at room temperature h_{fe} = 100, h_{ie} = 600 Ω, $[A_{ie}]$ = 10 at 10 MHz, C_e = 3 pF. Find f_β, f_T, C_e, $r_{b'e}$ and $r_{bb.}$

4 (a) Give the low frequency analysis of FET amplifier.

(b) The gain of an RC coupled 2 stage FET amplifier falls by 90% of the mid band value at 400 KHz. If g_m of each FET is 10 mA/V, and total output capacitance for each stage is 20 pF. Calculate the R_L required and the stage mid band gain.

5 (a) Draw the circuit diagram of a voltage shunt feedback using BJT and derive expression for voltage gain with feedback.

(b) Draw the circuit for current shunt amplifier and justify the type of feedback. Derive the expression for A_v, β, R_i and R_o for the circuit.

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6 (a) Why the LC oscillators are not suitable for low frequency applications. Explain the principle of working of basic LC oscillators.

(b) In a transistorized Hartley oscillator the two inductances are 2 mH and 20 μH while the frequency is to be changed from 950 KHz to 2050 KHz. Calculate the range over which the capacitor is to be varied.

7 (a) Prove that in class A power amplifier if the distortion is 10% then the power given to the load increased by 1%.

(b) A class B push-pull power amplifier has V_{CC} = 50 V, the collector voltage swing from V_{CC} down to 10 V with input signal. If the transistors used as maximum power dissipation rating of 20 W. Calculate

(i) The load presented by the output transformer.

(ii) Power output.

(iii) D.C power input.

(iv) Efficiency of collector circuit.

(v) Power delivered to the load if the transformer efficiency is 85%.

8 (a) With neat circuit diagram, explain the working of double tuned amplifier.

(b) What are advantages of double tuned amplifier? Derive an expression for I_2 maximum.

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