Code: 9A04402 **R09**

B.Tech II Year II Semester (R09) Supplementary Examinations December 2017

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) Derive an expression for the voltage gain of common emitter amplifier by using low frequency equivalent circuit.

(b) Am emitter follower circuit has following parameters R_L = 1 kΩ, R_s = 50 Ω, h_{fe} = 50, h_{ie} = 1 kΩ, h_{oe} = 50 kΩ, R_1 = 100 kΩ, R_2 = 10 kΩ, R_E = 10 kΩ. Calculate R_i, R_o, A_v and A_i for the above specification.

2 (a) Show that the input impedance and overall voltage gain of a Darlington pair is much larger compared to an individual CE amplifier with same transistor.

(b) Three identical stages of amplifiers cascaded with lower and upper cut off frequencies given by 300 Hz and 5 kHz respectively, compute the overall lower and higher cut off frequencies.

3 Draw the high frequency hybrid π model of a BJT and derive the equations for trans conductance and input conductance of CE amplifier using high frequency model.

4 What is small signal model of a FET? Derive the relationship between small signal parameters of a FET. Also explain about the frequency response of Common gate amplifier.

5 Apply the method of feedback circuit analysis for a voltage series feedback amplifier and explain all steps with appropriate diagrams and evaluate the amplifier parameters with feedback.

6 (a) Find the capacitance C and h_{fe} for the transistor Phase-Shift oscillator to provide a resonating frequency of 10 kHz. Assume R_1 = 25 kΩ, R_2 = 60 kΩ, R_c = 40 kΩ, R = 7.1 kΩ and h_{ie} = 1.8k.

(b) Explain the Barkhausen criterion for sustained oscillations and also explain how the criterion is applicable in Wein-bridge oscillator.

7 (a) Differentiate between push-pull and complementary-symmetry configurations of a class B power amplifier.

(b) Explain the reasons for crossover distortion in class-B power amplifiers and suggest a suitable circuit for its minimization.

8 (a) Discuss the effect of cascading double tuned amplifiers on bandwidth.

(b) What is the importance of stagger tuning? Explain briefly about stagger tuned amplifiers.

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