

B.Tech II Year II Semester (R09) Supplementary Examinations May/June 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

- 1 Derive the equation for the current gain, input impedance, voltage gain and output impedance of an emitter follower in terms of common emitter h-parameters.
- 2 (a) For a Darlington pair, the overall current gain and input impedance with an emitter resistance are given as 1130Ω and $1.2 M\Omega$ respectively. Calculate the value of emitter resistance R_E .
 (b) Derive the expressions for overall voltage gain, current gain and power gain, when two identical amplifier stages are cascaded.
- 3 (a) Draw the hybrid π model for a common emitter transistor and explain.
 (b) Explain about Gain-Bandwidth product of an amplifier.
- 4 A common source FET amplifier has a load resistance of $500 k\Omega$. The ac drain resistance of the device is $100 k\Omega$ and the transconductance is $0.8 mA/V$. Calculate the voltage gain of the amplifier.
- 5 (a) An amplifier with negative feedback gives an output of $12.5 V$ with an input of $1.5 V$. When feedback is removed, it requires $0.25 V$ input for the same output. Find the value of voltage gain without feedback.
 (b) Explain the procedure to obtain the basic amplifier configuration without feedback but taking the loading of the feedback network into account.
- 6 (a) Derive the expression for frequency of oscillation of BJT phase-shift oscillator and explain its operation with neat circuit diagram.
 (b) A crystal oscillator has the following parameters: $L = 0.33 mH$, $C = 0.065 pF$, $C = 1.0 pF$ and $R = 5.5 k\Omega$. (i) Find the series resonant frequency. (ii) Find the Q of the crystal.
- 7 (a) Explain how the power amplifiers are classified based on their class of operation and also compare them.
 (b) Derive the expression for maximum efficiency and working of a transformer coupled class A amplifier.
- 8 (a) Explain the operation of a single tuned amplifier circuit and obtain its frequency response.
 (b) Discuss the effect of cascading single tuned amplifiers on bandwidth.
