

R15

Code No: 124CV

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B.Tech II Year II Semester Examinations, May - 2017

ELECTRONIC CIRCUIT ANALYSIS

(Common to ECE, EIE, ETM)

Time: 3 Hours

Max. Marks: 75

Note: This question paper contains two parts A and B.

Part A is compulsory which carries 25 marks. Answer all questions in Part A.

Part B consists of 5 Units. Answer any one full question from each unit.

Each question carries 10 marks and may have a, b, c as sub questions.

PART- A

(25 Marks)

- 1.a) Why is a CE amplifier widely used? List down its main limitations. [2]
- b) What are the typical values of h-parameters of CE configuration? [3]
- c) What is f_T of a BJT? [2]
- d) State Miller's theorem. [3]
- e) Compare Frequency stability of crystal oscillator, RC and LC oscillators. [2]
- f) What are the advantages of negative feedback? [3]
- g) What is Class-A power amplifier? [2]
- h) Classify power Amplifiers. [3]
- i) What is effect of cascading on single tuned amplifier? [2]
- j) What is stagger tuned amplifier? [3]

PART-B

(50 Marks)

- 2.a) Draw the CE amplifier with un bypassed emitter resistance and derive expression for R_i and A_v .
- b) A transistor in CB circuit has the following set of 'h' parameters. $h_{ib} = 20$, $h_{rb} = 0.98$, $h_{fb} = 3 \times 10^{-4}$, $h_{ob} = 0.5 \times 10^{-6}$. Find the values if R_i , R_o , A_i and A_v , if $R_s = 600\Omega$ and $R_L = 1.5 k\Omega$. [5+5]

OR

- 3.a) Draw the Darlington circuit and derive the expressions for the overall current gain, voltage gain, input impedance and output impedance.
- b) With the help of a neat circuit diagram describe the working of a cascade amplifier. [5+5]
- 4.a) Draw the hybrid-II model of common emitter configuration and describe each component in the II-model.
- b) Derive the equation for voltage gain bandwidth product for CE amplifier. [5+5]

OR

- 5.a) Discuss the effect of different types of loads to a common source MOS amplifier.
- b) Draw the CS FET amplifier equivalent circuit looking into the drain and find its gain and output impedance. [5+5]

5.a) Explain the principle of negative feedback in amplifiers. Show quantitatively the effect of negative feedback on (i) Gain (ii) Stability (iii) Noise (iv) Distortion.

b) Show that current-series negative feedback increases the input impedance and increases the output impedance. [5+5]

OR

7. Starting from the description of a generalized Oscillator, derive the expression for frequency of Oscillation in a Colpitts Oscillator. [10]

8. Describe the operation of Class B Push pull amplifier and show how even harmonics are eliminated. [10]

OR

9.a) Derive the expression for maximum conversion efficiency for a simple series fed Class A power amplifier.

b) A push pull amplifier utilizes a transformer whose primary has a total of 160 turns and whose secondary has 40 turns. It must be capable of delivering 40W to an $8\ \Omega$ load under maximum power conditions. What is the minimum possible value of V_{cc} ? [5+5]

10. Explain the operation of doubly-tuned amplifier with a neat circuit diagram and derive the equation for its gain bandwidth product. [10]

OR

11. What is the effect of cascading double tuned Amplifiers on Band width? Derive the related equations. [10]

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