

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.  $h_{ib} = 20$ ,  $h_{fb} = 0.98$ ,  $h_{rb} = 3 \times 10^{-4}$ ,  $h_{ob} = 0.5 \times 10^{-6}$ . 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]

- 6.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 doubled-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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