

**Code No: 114CV****JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD****B.Tech II Year II Semester Examinations, October/November - 2016****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) What are the merits and demerits of a cascade amplifier over a simple CE amplifier? [2]
- b) Compare CE, CC and CB with their characteristics. [3]
- c) Draw the small signal model of source follower. [2]
- d) Write a short note on frequency response of BJT amplifiers. [3]
- e) Define sensitivity & Desensitivity factors in feedback Amplifiers. [2]
- f) Briefly discuss about the effect of feedback on amplifier Bandwidth. [3]
- g) What are the drawbacks of transformer coupled power amplifiers? [2]
- h) Write the applications of Heat Sinks. [3]
- i) Define Q-factor. [2]
- j) What happens when no. of stages is increased in single tuned cascaded amplifiers? [3]

**PART – B****(50 Marks)**

2. Draw the circuit diagram of Common Collector amplifier. Derive the expression for  $A_i, A_v, R_i$ , and  $R_o$  in terms of h-parameters of CE transistor. [10]

**OR**

- 3.a) Explain RC-coupled CE transistor circuit, Write the expressions for current gain. [5+5]
- b) Compute the overall lower cut-off frequency of an identical two stage cascade of amplifiers with individual lower cut-off frequency given as 412 Hz. [5+5]

- 4.a) Draw the small-signal high frequency CE model of a transistor. [5+5]
- b) What is the relationship between  $f_T$  and  $f_\beta$ ? Discuss the significance of  $f_T$ . [5+5]

**OR**

- 5.a) Discuss the effect of coupling capacitors of a CE amplifier on the overall frequency response of the amplifier. [5+5]
- b) Draw and explain the FET high frequency model. [5+5]

- 6.a) Derive an expression for frequency of oscillation of a RC phase-shift oscillator using a FET.
- b) Design a RC phase-shift oscillator to operate at a frequency of 5KHz. use a MOSFET with  $\mu = 51$  and  $r_d = 5.5K$ . The phase - shift network not load the amplifier, Find the minimum value of the drain - circuit resistance for which the circuit will oscillate. [5+5]

**OR**

- 7.a) Draw the four types of feedback amplifiers and explain them briefly.
- b) What are the characteristics of an amplifier that are modified by negative feedback? [5+5]

8. Define conversion efficiency. Determine the maximum value of conversion efficiency for a series - fed class A power amplifier. [10]

**OR**

9. Briefly explain the distortion in power-amplifier and Thermal stability. [10]
10. What is a tuned amplifier and how do you classify tuned amplifier. Briefly explain. [10]

**OR**

11. Derive the expressions for Bandwidth and Q-factor of single tuned, capacitively coupled amplifiers. List the assumptions made for the derivation. [10]

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