

Code No: RT22041

R13**SET - 1**

II B. Tech II Semester Supplementary Examinations, November-2017
ELECTRONICS CIRCUIT ANALYSIS
(Com. to ECE, EIE)

Time: 3 hours

Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
2. Answer **ALL** the question in **Part-A**
3. Answer any **THREE** Questions from **Part-B**

PART -A

1. a) Show that the voltage gain increases with cascading. (4M)
- b) Derive the expression for overall gain of a negative feedback circuit. (4M)
- c) Explain why LC oscillators are not used at low frequencies. (4M)
- d) An amplifier with a bandwidth of 20Hz to 20Khz is available. Find the overall bandwidth of an amplifier if $A=30\text{dB}$ and feedback factor is 0.2 (4M)
- e) What is thermal runaway? Explain it. (3M)
- f) Why do we go for tapped single tuned amplifier? (3M)

PART -B

2. a) What is a Giascelletto model of a Transistor? Derive the relationship between various parameters. (8M)
- b) A single stage Common Emitter amplifier is measured to have a voltage-gain bandwidth f_H of 5 MHz's with $R_L = 500 \text{ Ohms}$. Assume $h_{fe} = 100$, $g_m = 100 \text{ mA/V}$, $r_{bb'} = 1000$, $C_c = 1 \text{ pf}$, and $f_T = 400 \text{ MHz's}$. Find the value of the source resistance that will give the required bandwidth. (8M)
3. a) Draw the circuit for CASCODE Amplifier. Explain its working, obtain overall values of the circuit in terms of h-parameters. (8M)
- b) Discuss about the effect of cascading on bandwidth of multistage amplifiers. (8M)
4. a) Enumerate and explain with necessary derivations the characteristics that get affected with negative feedback. (8M)
- b) Analyze CE with R_e circuit using linear analysis and negative feedback circuit. (8M)
5. a) Derive the frequency of oscillation and condition for sustained oscillation in a FET based RC Phase shift oscillator. (8M)
- b) What is a clapp oscillator and discuss its advantages compared to colpitts oscillator. (8M)
6. a) What is a power amplifiers and are classify them based on class of operation and also compare them (8M)
- b) Derive the expression for conversion efficiency of a Class B Power amplifier. (8M)
7. a) Draw the diagram of a capacitance coupled tuned amplifier and derive an expression for its quality factor. (8M)
- b) Show that Bandwidth decreases with cascading of single tuned amplifiers. (8M)