

Code No: R22043

R10**SET -1****II B. Tech II Semester Supplementary Examinations, November - 2018****ELECTRONIC CIRCUIT ANALYSIS**

(Com. to ECE, EIE)

Time: 3 hours

Max. Marks: 75

Answer any **FIVE** Questions
All Questions carry **Equal** Marks
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1. a) What is amplifier, Draw the circuit diagram of a CC amplifier and explain its working (8M)  
b) Draw the AC equivalent circuit of a CC amplifier using h-parameter model and derive the equations for input impedance, output impedance, voltage gain and current gain (7M)
2. a) A voltage-series negative feedback amplifier has a voltage gain without feedback of  $A=500$ , input resistance  $R_i=3K\Omega$ , output resistance of  $R_o=20K\Omega$  and feedback ratio  $\beta=0.01$ , calculate the voltage gain  $A_f$ , input resistance  $R_{if}$  and output resistance  $R_{of}$  of the amplifier with feedback (8M)  
b) Explain the general characteristics of negative feedback amplifiers (7M)
3. Explain the working of a (15M)  
(i) Miller Crystal Oscillator  
(ii) Pierce crystal oscillator
4. a) Differentiate direct coupling and transformer coupling (8M)  
b) Explain about difference amplifier two stage RC coupled JFET amplifiers in CS configuration (7M)
5. a) A BJT has  $h_{ie}=224$  at  $I_c=1mA$ , with  $f_T=80MHz$  and  $C_{b'c}=12pF$ . Determine (i)  $g_m$  (8M)  
(ii)  $r_{bb'}$  (iii)  $r_{b'e}$  at room temperature and a collector current of  $1mA$ . Determine the parameters  $g_m$ ,  $r_{bb'}$ ,  $r_{b'e}$ ,  $C_{b'e}$  of the small signal high frequency of the BJT  
b) Explain about Hybrid- $\pi$  Common emitter transistor model (7M)
6. a) What is Heat-sink. explain the different types of Heat sinks (8M)  
b) Determine the power dissipation capability of a transistor, which has been mounted with a heat sink having thermal resistance  $\Theta_{HS-A}=8^\circ C/W$ ,  $T_A=40^\circ C$ ,  $T_J=160^\circ C$ ,  $\Theta_{J-C}=5^\circ C/W$  and  $\Theta=85^\circ C/W$  (7M)
7. a) Define Q-factor, derive the expressions for Q factors of RL and RC circuits (8M)  
b) Explain about the stability of Tuned amplifiers (7M)
8. a) Derive the expression for output load regulation for in voltage shunt regulator. Assume current limiting is achieved by the transistor. (8M)  
b) How is short circuit current protection provided for an IC voltage regulator (7M)