Code No: OR310253 **OR**

III B.Tech I Semester Supplementary Examinations, April/May 2005
ELECTRONIC CIRCUITS
(Electrical & Electronic Engineering)

Time: 3 hours **Max Marks: 70**

Answer any FIVE Questions
All Questions carry equal marks

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1. (a) Why biasing is necessary in BJT amplifiers? And discuss about the factors against which an amplifier needs to be stabilized.
   (b) A self-bias circuit has $h_{FE} = 100, V_{CC} = 5V and V_{BE(active)} = 0.6V$. Calculate the values of $R_1 and R_C$ such that collector current of 1mA and V_{CE}=2.5V.

2. (a) Derive the expressions for $A_i, R_i, A_v and R_o$ of CE amplifier in terms of h-parameters.
   (b) Write notes on emitter follower.

3. (a) Derive the relation between h-parameters of CE amplifier and CB amplifier.
   (b) Write short notes on bias stabilization and bias compensation as refered to transistor Biasing.

4. (a) Given h-parameters. $h_{ie} = 500\Omega, h_{oe} = 10^{-5}A/V, h_{fe} = 100, h_{re} = 10^{-4}$ of a transistor at $I_C = 10mA, V_{CE} = 10V$, and at room temperature. At the same operating point, $f_t = 50MHz and C_ob = 3PF$, calculate the values of all the hybrid -p parameters.
   (b) Defind alpha and beta cutoff frequencies and what is their significance.

5. (a) Why self-bias is not suitable foe depletion type and enhancement type MOSFET?
   (b) In a Drain-to-gate bias circuit $V_{CD} = 12V, R_d = 2k\Omega, R_f = 10m\Omega$. Calculate VGS, ID and VDS for $I_{D(ON)} = 6mA, V_{GS(ON)} = 8V, V_{GS(TH)}$=3V.

6. (a) Classify various feedback amplifiers and explain how their i/p and o/p resistances vary with feedback.
   (b) The circuit parameters of collector-to-base bias circuit and: $V_{CC} = 10V, R_C = 10K, R_b = 100K. R_s = 1k\Omega, h_{fe} = 100, h_{ie} = 1k.$ while $h_{re} and h_{oe}$ are negligible. Determine $A_V, A_{VS}, R_{if}, and R_{of}$.

7. (a) Explain the conditions for oscillations.
   (b) Explain the principle and working of colpitts oscillator and derive an expression for the frequency of oscillations.

8. Write short notes on any THREE of the following:
   (a) Thermal Runaway
   (b) Thermal compensation techniques

(c) FET as VVR

(d) Hartley oscillator.

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