

II B.Tech I Semester(RR) Supplementary Examinations, May/June 2010

ELECTRONIC CIRCUITS ANALYSIS
(Electronics & Communication Engineering)

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. (a) Sketch the circuit of a source follower and explain .
(b) Derive expression for voltage gain at low frequencies
(c) What is the maximum value of voltage gain and order of magnitude of output impedance [6+5+5]
2. (a) Define f_β and f_T and derive the relation between f_β and f_T .
(b) The h-parameters of a transistor at $I_c = 8\text{mA}$, $V_{CE} = 10\text{V}$, and at room temperature are $h_{ie} = 1\text{K}\Omega$, $h_{oe} = 2 \times 10^{-5} \text{ A/V}$, $h_{fe} = 50$, $h_{re} = 2.5 \times 10^{-4}$. At the same operating point, $f_T = 60 \text{ MHz}$, and $C_{ob} = 2\text{PF}$. Compute the values of hybrid - π parameters. [6+10]
3. (a) Draw the circuit of two stage R-C coupled JFET amplifier and explain its working.
(b) If six identical R-C coupled amplifiers are cascaded each having $f_1 = 100 \text{ Hz}$, determine the overall f_1 . [8+8]
4. (a) Define about class A, class B, class AB and class C operation of power amplifiers.
(b) Design a class B power amplifiers to deliver 25W to a load resistor $R_L = 8\Omega$, using transformer coupling. $V_m = V_{cc} = 25\text{V}$. Assume reasonable data wherever necessary. [6+10]
5. (a) Calculate the second harmonic distortion, if the output signal waveform of a push pull amplifier has measured values of $V_{CEmin} = 1 \text{ V}$; $V_{CEmax} = 24 \text{ Volts}$ and $V_{CEQ} = 14 \text{ V}$; using an oscilloscope.
(b) Explain harmonic distortion and crossover distortions in power amplifiers. [8+8]
6. (a) Derive the equation for the 3 dB bandwidth of double tuned amplifier.
(b) Discuss the effect of cascading tuned amplifier Bandwidth. [8+8]
7. (a) Define the following terms.
 - i. Load regulation
 - ii. Line regulation
 - iii. Temperature Stability.
(b) Give the circuit of a short circuit overload protection that is to be provided in a voltage regulator circuit and explain its working. [6+10]
8. (a) What is meant by voltage multiplier? List out the names of four different multipliers.
(b) Draw the circuit of a full-wave voltage doubler circuit and explain its operation. Mention the PIV of each diode. [6+10]
