Code No: R059210404 **Set No. 3**

II B.Tech I Semester Regular Examinations, November 2007
ELECTRONIC CIRCUIT ANALYSIS
(Common to Electronics & Communication Engineering and Electronics & Telematics)

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

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1. (a) Draw the circuit diagram and low frequency equivalent circuit of common source amplifier and derive an expression for its voltage gain.
   (b) For the emitter follower circuit with R_S = 0.5K and R_L = 5K, calculate A_I, R_i, A_V, A_{VS}, and R_0. Assume, h_{fe} = 50, h_{ie} =1K, h_{oe} = 25 μA/V. [8+8]

2. (a) Discuss about different types of distortions that occur in amplifier circuits
   (b) Three identical non interacting amplifier stages in cascade have an overall gain of 1 dB down at 30 Hz compared to mid band. Calculate the lower cutoff frequency of the individual stages. [8+8]

3. (a) Draw Hybrid - π model for a transistor in the CE configuration and explain the significance of every component in this model.
   (b) Given a germanium p-n-p transistor whose basewidth is 10^{-4} cm. At room temperature and for a dc emitter current of 2 mA, find
      i. emitter diffusion capacitance,
      ii. f_T [Assume Diffusion constant as 47 cm^2/sec]. [8+8]

4. (a) Classify large signal amplifiers based on its operating point. Distinguish these amplifiers in terms of the conversion efficiency. [8]
   (b) Draw the push-pull power amplifier circuit. Derive the expression for the output current in push ?pull amplifier with base current as $i_b = I_{bm} \sin wt$. [8]

5. (a) Draw and explain the circuit diagram of a single tuned Capacitance coupled amplifier. Also explain its operation?
   (b) Draw and explain the significance of Gain versus Frequency curve of tuned amplifiers when they are used in radio amplifiers?
   (c) Draw the Ideal and actual frequency response curves of a single tuned amplifier? [8+4+4]

6. Explain how the stagger-tuned design is superior over synchronously tuned design in the design of a multistage amplifier? Also draw their circuit diagrams and their equivalent circuits? [16]

7. (a) What is Voltage regulator? Explain with the help of neat circuit diagram how zener diode is used as a shunt voltage regulator?

(b) In figure 7 shown Vi=20V, Rs=200 ohms and Vz=12V, VBE =0.65V find output voltage, collector to emitter voltage of the transistor and the current in 200 ohms resistor? [8+8]

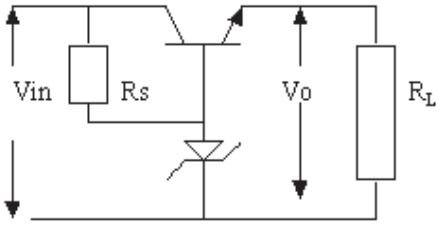

Figure 7

8. (a) Draw and explain the output of pulse width modulator for different types of inputs with respect to switching regulator.

(b) Draw the circuit and explain the operation of basic switching type regulator. [8+8]

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