

I B.Tech Examinations, May/June 2012
BASIC ELECTRONIC DEVICES AND CIRCUITS
Electrical And Electronics Engineering

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. (a) The output impedance may be calculated as the ratio of the open circuit voltage to the short circuit current. Using this method evaluate output resistance with feedback R_{of} for a current-series feedback amplifier.
 (b) Draw an emitter follower circuit diagram and find the feedback factor and the input resistance with feed back. [8+8]

2. Verify the following equations for the transistor phase-shift oscillator of shown in figure 2.

$$f = \frac{1}{2\pi RC} \frac{1}{\sqrt{6+4k}}$$

$$h_{fe} = 4k + 23 + 29/k$$

Where $k=R_c/R$

[16]

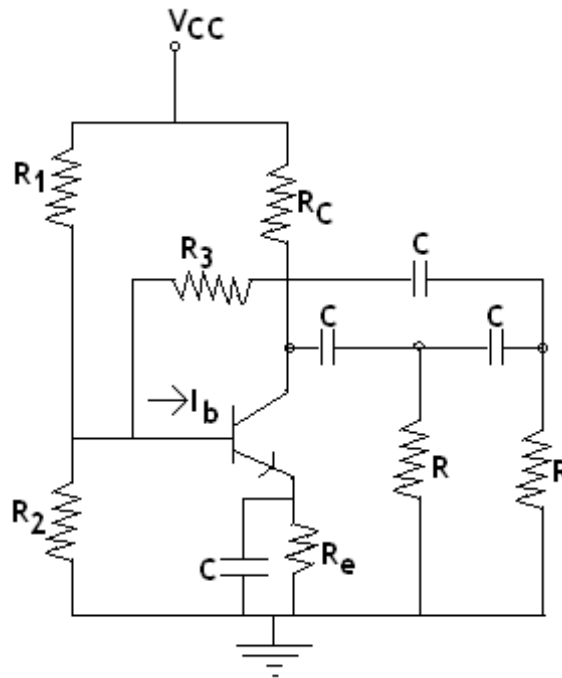


Figure 2

3. (a) Compare BJT, JFET and MOSFET in all respects.
 (b) Draw the static characteristics of SCR for different gate currents and explain briefly. [8+8]

4. Show that for the CG amplifier with $R_s=0$ and $C_{ds}=0$
 $y_i = g_m + g_d(1 - A_V) + j\omega C_{gs}$ [16]

5. (a) Give the block diagram of CRO and explain about each block in detail.
- (b) In a electrostatic deflecting CRT the length of the deflection plates is 2cm, and spacing between deflecting plates is 0.5cm, The distance from the centre of the deflecting plate to the screen is 20cm, the deflecting voltage is 25V. Find the deflecting sensitivity, the angle of deflection and velocity of the beam. Assume final anode potential is 1000V. [8+8]
6. (a) Draw the circuit diagram of a Half wave rectifier. Explain the operation of the circuit with relevant waveforms.
- (b) A bridge rectifier uses four identical diodes having forward resistance of 5Ω each. Transformer secondary resistance is 5 ohms and the secondary voltage is 30 V(rms). Determine the DC output voltage for $I_{dc} = 200$ mA and value of the output ripple voltage. [8+8]
7. (a) With the help of necessary equations, explain the terms:
- Cut-in voltage
 - Reverse saturation current
 - Transition capacitance
 - Diffusion capacitance.
- (b) Calculate the dynamic forward and reverse resistance of a p-n junction diode when the applied voltage is 0.2V. $I_0 = 2\mu A$, $T = 25^\circ C$. Consider germanium diode. [12+4]
8. (a) Compare the advantages and disadvantages of biasing schemes.
- (b) Calculate the quiescent current and voltage of collector to base bias arrangement using the following data:
 $V_{cc} = 10V$, $R_b = 100K\Omega$, $R_c = 2K\Omega$, $\beta = 50$ and also specify a value of R_b so that $V_{ce} = 7V$. [8+8]
