

II B.Tech(ccc) Regular Examinations, December 2007

**ELECTRONIC CIRCUITS**

( Common to Electrical &amp; Electronic Engineering and Electronics &amp; Communication Engineering)

Time: 3 hours

Max Marks:100

Answer any FIVE Questions  
All Questions carry equal marks

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1. Define the following terms w.r.t. OP-AMP.

- (a) input offset current
- (b) output offset voltage
- (c) power supply Rejection Ratio
- (d) slew Rate
- (e) input offset voltage Drift.

[5×4 = 20]

2. (a) Derive the expressions for  $A_v$ ,  $Z_i$ ,  $Z_o$  and  $A_i$  of current series feedback.
- (b) Identify the topology of feedback in the given circuit (figure1) giving justification. Two transistors identical with  $h_{ie} = 2k$  and  $h_{fe} = 100$ . Calculate  $R_{if}$ ,  $A_{if}$  and  $A_{vf}$ .

[10+10]

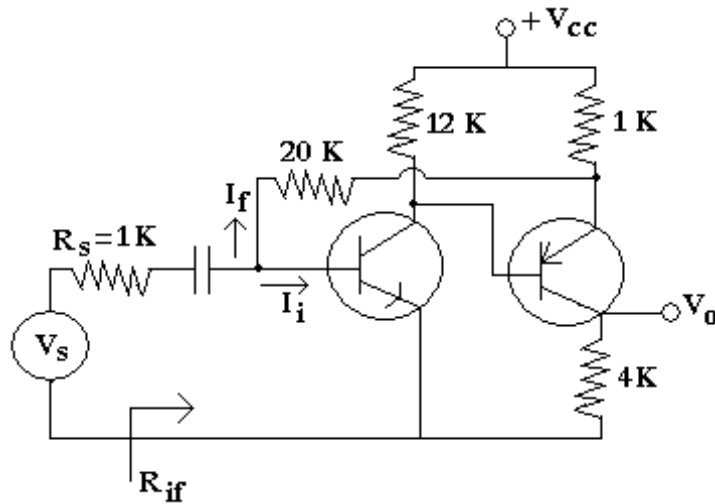


Figure 1:

3. (a) Show that the gain of Wien bridge oscillator using BJT amplifier must be at least 3 for the oscillations to occur.
- (b) In a transistorized Hartley oscillator the two inductances are 2mH and 20μH while the frequency is to be changed from 950KHZ to 2050KHZ. Calculate the range over which the capacitor is to be varied.

[12+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.  $V_m=V_{cc}=25V$ . Assume reasonable data wherever necessary. [8+12]
5. (a) Draw the basic circuit diagram of negative peak clamper circuit and explain its operation. [8]  
 (b) For the circuit shown in figure 5b, an input voltage  $V_i$  linearly varies from 0 to 150 V is applied. Sketch the output voltage  $V_o$  to the same time scale. [12]  
 Assume ideal diodes.

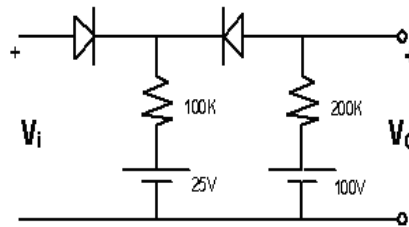


Figure 5b

6. (a) Draw the construction and characteristics of a four layer diode and explain its working.  
 (b) Why is a current-controlled negative resistance device characterized as being short-circuit stable? [12+8]
7. (a) With the aid of a neat circuit diagram and suitable waveforms, explain the operation of a transistor, Bootstrap time-base generator. Suggest a method to reduce the recovery time of the same. [10]  
 (b) The circuit shown is a variation of the bootstrap which avoids the need for a voltage source neither side of which is grounded. Show that precise linearity results if the amplifier gain is  $A=1+R_2/R_1$ . (figure 7b) [10]

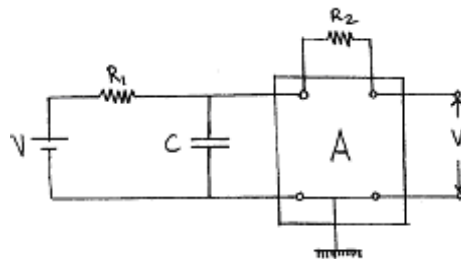


Figure 7b

8. (a) Explain the principle of “synchronization” and ‘synchronization with frequency division’. [10]  
 (b) Explain the method of pulse synchronization of relaxation devices, with examples. [10]

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