ROLL NO.................

2007 ANDHRA UNIVERSITY

B.TECH COMPUTER SCIENCE ENGINEERING
II B.TECH II SEMESTER
ELECTRONICS-II

TIME: 3 HOUR
MARK: 70

- First Question Is Compulsory
- Answer Any Four From The Remaining Questions
- All Questions Carry Equal Marks
- Answer All Parts Of Any Question At One Place

1. (a) State the reasons for the increase in te bandwidth of an amplifier with feedback.

(b) State the effect of voltage shunt on the input and output impedances of an amplifier with feedback.

(c) Why RC oscillators cannot be used at radio frequencies?

(d) Define "unity gain bandwidth" and "full power bandwidth" of an operational amplifier.

(e) Why an operational amplifier is not used in open-loop condition for linear aplications?

(f) What is "resolution time" of a binary circuit?

(g) State the applications of monostable multivibrator.

2. (a) Prove the negative feed back in amplifiers reduces the gain and increases the signal-to-noise ratio. State the assumptions made in your derivations.

(b) Find the voltage gain and the feedback factor of the feedback amplifier that produces 90 watts of power with 0.05% distortion. The local resistance is 8 ohms. The output stage supplies 90 watts to the 8 ohm load in the non-feedback case with 4% harmonic distortion The input single for 90 watts of output is to be 1.0 volt with feedback.

3. (a) State and explain Barkhausen criterion for electronic systems to oscillate with feedback.

(b) For the feedback amplifier shown in figure 1.0, determine Avf = ?o / ?s, Rif and Rof. Assume that the BJTs are identical and have hie =1.5 KO, hfe = 80, hre = hoe = 0 as parameters.
-----DIAGRAM-----

4. (a) Explain why the oscillators incorporating crystals have excellent frequency stability.

(b) Draw the circuit diagram of a Colpitt's oscillator and explain how the Barkhausen criterion are satisfied. Derive the expressions for its frequency and condition for oscillations.

5. (a) Draw the circuit diagram of a stable differentiator using an operational amplifier and explain with necessary frequency characterstics how it can provide stable operation.

(b) Realize Vo = 2V1 - 3V2 + 4V3 using an operational amplifier and resistances.

(c) Explain with a neat circuit diagram how CMRR of an operational amplifier is measured.

6. (a) Realize (i) an inverting amplifier and (ii) a non-inverting amplifier to provide a gain of 20 and compare them with reference to their input impedances.

(b) Design a monostable multivibrator of collector coupled to provide a delay pulse of 100 μ secs on application of trigger. Use BJTs having hfe = 80, VBE(sat) =0.7V, VCE(sat) = 0V, VBE(cutoff) =

0V. Assume supply voltages of ± 10V and IC(sat) =2 mA. Show the circuit diagram with all the component values and explain its operation with the waveforms seen at both the collectors and bases.

7. (a) Distinguish between symmetrical and non-symmetrical triggering of multivibrators.

(b) Design a binary circuit of fixed bias using BJTs having hfe(mu) = 80, VBE(sat)= 0.7V, VCE(sat) =0.2V and VBE(cutoff) = 0V. Assume supply voltages of ±10 V are available. Take IC(sat) =5 mA. Show the circuit diagram with all the component values. Prove that when one transistor is "ON" the other Transistor is "OFF".

8. Write short notes on the following:

(a) Crystal controlled oscillator.

(b) Astable multivibrator.

(c) Integrator circuit using an operational amplifier.4