

ANNA UNIVERSITY COIMBATORE
 B.E. / B.TECH. DEGREE EXAMINATIONS – JUNE 2009
 REGULATIONS : 2007
 FOURTH SEMESTER – ELECTRONICS AND COMMUNICATION ENGG.
 070290045 – ELECTRONIC CIRCUITS II

TIME : 3 Hours

Max. Marks : 100

PART - A

(20 x 2 = 40 Marks)

ANSWER ALL QUESTIONS

1. Define CMRR in a differential amplifier.
2. List the non-ideal characteristics of differential amplifier.
3. What is the need for differential amplifier?
4. Draw the frequency response of differential amplifier.
5. List the advantages of negative feedback.
6. A feedback amplifier has an open loop gain of 600 and feedback factor $\beta = 0.01$. Find the closed loop gain with negative feedback.
7. Draw the topology of a voltage shunt feedback amplifier.
8. The gain and distortion of an amplifier are 100 and 4% respectively. If a negative feedback with $\beta = 0.3$ is applied, find the new distortion in the system.
9. State Barkhausen criterion for sinusoidal oscillators.
10. How does crystal oscillator maintain frequency stability?
11. Give the expression for frequency of oscillations of Wien bridge oscillator.
12. What is negative resistance Oscillator? Give an example.
13. A tuned amplifier has its maximum gain at a frequency of 2 MHz and has a bandwidth of 50 kHz. Calculate the Q-factor.
14. Briefly explain narrow band neutralization?
15. Draw the circuit of a second order butterworth filter.
16. Determine the bandwidth of a 3 stage cascaded single stage tuned amplifier if the resonant frequency is 455 kHz and the loaded Q of each stage is 10.

17. State the expression for gate width of monostable multivibrator.
18. What is the function of commutating capacitors in bi stable multivibrator?
19. Draw a simple current time base circuit and give its expression relating current and time.
20. Define sweep time and flyback time with respect to a voltage time base signal.

PART - B

(5 x 12 = 60 Marks)

ANSWER ANY FIVE QUESTIONS

21. a. Explain the operation of emitter coupled BJT differential amplifier circuit with active load. 6
 b. Draw a MOS differential pair and discuss its small signal operation. 6
22. a. Using the block diagram, derive the closed loop form transfer ratio of a feedback system in terms of the open gain. 6
 b. Discuss the effect of negative feedback on the frequency response of an amplifier. 6
23. a. Design an RC phase shift oscillator to generate 5 kHz sine wave with 20 V peak to peak amplitude. Draw the designed circuit. Assume $h_{fe} = 150$. 8
 b. In a colpitt's oscillator $C_1 = 0.001 \mu F$, $C_2 = 0.01 \mu F$ and $L = 10 \mu H$. Find the frequency of oscillation, feedback factor and voltage gain. 4
24. The circuit given in figure 1 has the following parameters $R_c = 4k\Omega$, $R'_s = 40k\Omega$, $R_s = 10k\Omega$, $h_{ie} = 1.1k$, $h_{fe} = 50$ and $h_{re} = h_{oe} = 0$. Find A_{v_i} , R_{i_f} and R_{o_f} . 12

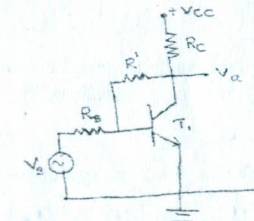


Figure 1

25. a. A parallel resonant circuit has an inductance of $150\ \mu\text{H}$ and a capacitance of $100\ \text{pF}$. Find the resonant frequency. 2
- b. Draw the circuit of wein bridge oscillator using BJT. Show that the gain of the amplifier must be at least 3 for the oscillations to occur. 10
26. a. With circuit diagram and frequency response characteristics compare double tuned and stagger tuned amplifiers 8
- b. A tank circuit contains an inductance of $1\ \text{mH}$. Find out the range of tuning capacitor value if the resonant frequency ranges from $540\ \text{kHz}$ to $1650\ \text{kHz}$. 4
27. a. With neat circuit diagram explain the working of astable multivibrator. Derive its time period. Draw the base and collector waveforms. 8
- b. Determine the values of the capacitors to be used in an astable multivibrator to provide a train of pulse $2\ \mu\text{s}$ wide at a repetition rate of $100\ \text{kHz}$ if $R_1 = R_2 = 20\text{k}\Omega$. 4
28. a. With circuit diagram discuss the operation of Schmitt trigger circuit. 4
- b. Explain Bootstrap time base sweep generator with circuit diagram and waveform. Derive its output voltage. 8

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