B.E.(with Credits)-Regular-Semester 2012-Electronics & Telecommunication / Communication Engineering / Electronics Engineering Sem V

ET/EN/EC501 - Linear Electronic Circuits / Linear Integrated Circuits

P. Pages : 2 **GUG/S/18/3744**

Time : Three Hours * 0 9 0 4 * Max. Marks : 80

Notes : 1. All questions carry marks as indicated.
2. Due credit will be given to neatness and adequate dimensions.
3. Assume suitable data wherever necessary.

1. a) The differential amplifier uses a transistor which has $\beta = 200$ and it is biased at $I_{CQ} = 100\mu A$. Determine R_C and R_E so that Adm = 500 and CMRR = 80dB. **8**

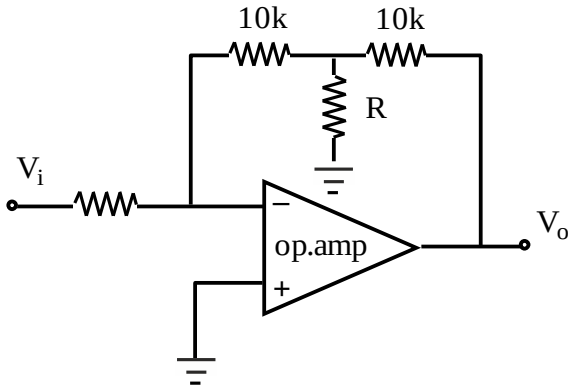
b) What is common mode Rejection Ratio? Why it is very very high? **8**

OR

2. a) For an inverting amplifier following data are given. **10**
$A = 2\times10^5$, $R_i = 2m\Omega$, $R_o = 75\Omega$, UGB = 1MHz, supply voltage = $\pm$ 15V. Maximum output voltage swing $= \pm 13V$ $R_1 = 1.8k$, $R_f = 18k$, compute the closed loop parameter A_f, A_{if}, R_{of} and F_t, V_{oot}, if $v_{in} = 1$ volt peak to peak sine wave at 100Hz.
i) Compute output voltage V_0.
ii) Draw the output waveform.

b) Explain the purpose of constant current source in differential amplifier. **6**

3. a) For the circuit shown, calculate the value of 'R' required to obtained $V_o = -50V_i$. **8**



b) Draw and explain grounded load voltage to current converter. **8**

OR

4. a) What are the limitations of ideal integrator circuit? How can be they eliminated in practical ore? **8**

b) The op-amp used as non-inverting amplifier has following specification. **8**

$\frac{\Delta V_{ios}}{\Delta T} = 30\,\mu v/^{o}C$, $\frac{\Delta I_{ios}}{\Delta T} = 10\,nA/^{o}C$

The amplifier is nulled at 25ºC and uses $R_1 = 100\Omega$ and $R_f = 8.2k\Omega$. If a 20mv peak to peak sine wave at 1000Hz is applied as input, calculate error voltage and output voltage at 45ºC.

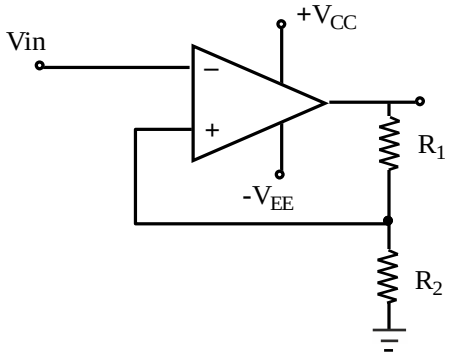
5. a) Explain the full-wave precision Rectifier using op-amp with the help of waveform and derivation. **8**

b) Draw and explain the working of IC741 as a stable multivibrator and write the equation for its frequency of oscillation. **8**

OR

6. a) Draw and explain analog multiplier circuit using op-amp. **8**

b) For the regenerative comparator shown in figure, determine the threshold voltages, Hysteresis voltage and draw the Hysteresis curve. Assume op-amp with saturation voltage =12V, $R_1 = 2k\Omega$, $R_2 = 3k\Omega$ and $V_{ref} = -4V$. **8**



7. a) Design a 2nd order Butterworth low pass filter whose bandwidth is 1.5KHz use all capacitor of 100nf. **8**

b) Draw and explain sample and Hold circuit with waveform. **8**

OR

8. a) What is oscillator? Explain Wein bridge oscillator in detail. **8**

b) Draw and explain in detail the working of successive approximation type A to D converter. **8**

9. a) Draw and explain the working of mono stable multivibrator using the IC555 and show the pulse width 7 = 1.1 RC. **8**

b) Draw the basic building block of PLL. Also define capture range and lock range. **8**

OR

10. a) Draw block diagram of IC723 voltage regulator and explain working of each block. **8**

b) Design a square wave generator using IC555 having output frequency 15KHz and Duty cycle 60%. **8**

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