

Linear Integrated Circuits (New)
(EC-305, Dec 2005)

Time: 3 Hrs

Max Marks: 60

Note: Section A is compulsory. Attempt any four questions from Section B and two questions from Section C.

Section-A

1. (a) An amplifier should have
(i) high fidelity (ii) low noise (iii) stable operation (iv) all of the above
(b) In differential amplifier, if the output voltage is measured between two collectors, the configuration is called.....
(c) Full form of CMRR is
(d) The operational amplifier can be used to amplify.....input signals.
(e) Large scale integration means.....number of components.
(f) The open loop bandwidth of the 741c is approximately.....
(g) Define input offset voltage.
(h) Name any two resistive transducers.
(i) What do you mean by integrator?
(j) List two most commonly used filters.

Section-B

2. What are the four differential amplifier configurations? Which one is not commonly used and why?
3. The 741C op-amp having the following parameters is connected as a non inverting amplifier Fig (1) with $R_i = 1k\Omega$ and $R_f = 1k\Omega$: $A = 200,000$, $R_i = 2M\Omega$, $R_o = 75\Omega$, $f_0 = 5Hz$, supply voltage = 15 V, output voltage swing = 13 V. Calculate the values of A_r and R_{iF} .
4. What are the advantages of active filters over passive filters?
5. Define supply voltage sensitivity. What is meant by a poor regulated power supply?
6. What are the major advantages and disadvantages of single-supply ac amplifier?

Section-C

7. Design a dual-input, balanced-output differential amplifier with a constant current bias (using diode) to satisfy the following requirements.
Differential voltage gain $A_d = 4010$
Current supplied by the constant current bias circuit = 4 mA
Supply voltage $V_S = 10 V$
8. (a) What is an all pass filter? Where and why it is needed?
(b) List the four negative feedback configurations. Which two configurations are most commonly used?
9. Write short notes on any two:
(a) Window detector
(b) 555 as Mono-stable Multivibrator
(c) First order Butterworth filter