

Roll No

EX-405 (New)**B.E. IV Semester**

Examination, June 2016

Linear Integrated Circuits and Applications*Time : Three Hours**Maximum Marks : 70*

- Note:** i) Answer five questions. In each question part A, B, C is compulsory and D part has internal choice.
ii) All parts of each question are to be attempted at one place.
iii) All questions carry equal marks, out of which part A and B (Max. 50 words) carry 2 marks, part C (Max. 100 words) carry 3 marks, part D (Max. 400 words) carry 7 marks.
iv) Except numericals, Derivation, Design and Drawing etc.

1.
 - a) What are the applications of an inverting amplifier?
 - b) Define Virtual Ground Concept.
 - c) Derive the required expression for closed loop gain of inverting amplifier.
 - d) Briefly explain the various types of operational amplifiers and their applications.

OR

Draw and explain the schematic block diagram of an Op-amp.

2.
 - a) Define input offset voltage and input offset current.
 - b) What is meant by Gain Bandwidth Product?

- c) A square wave with negligible rise time at a peak to peak amplitude of 500 mV must be amplified to a peak-to-peak amplitude of 3V, with a rise time of μ sec or less. Can a 741 with a slew rate of $0.5\text{V}/\mu\text{sec}$ be used?
- d) Define CMRR and its significance. Also derive the relation between output voltage and CMRR.

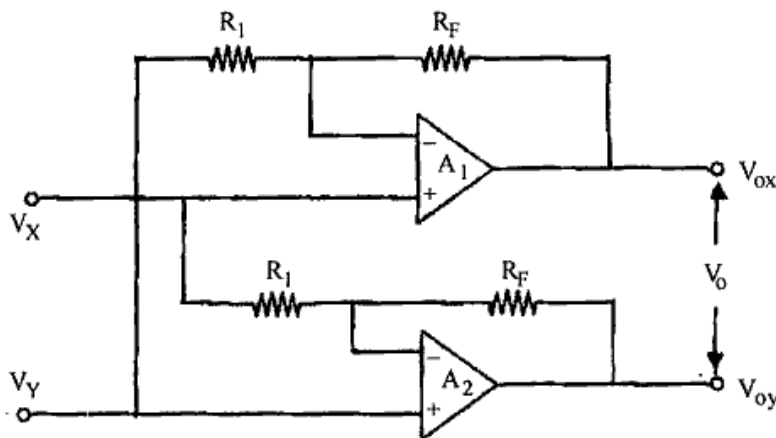
OR

Obtain the frequency response of an open-loop op-amp and discuss about the methods of frequency compensation.

3. a) Why are integrators preferred to differentiators?
- b) What is a transconductance amplifier? Give some examples.
- c) What are the properties of an instrumentation amplifier?
- d) What are the effects of feedback on the input and output impedances of an OPAMP under inverting configuration. Deduce necessary expressions to support your answers.

OR

Calculate the gain of the differential input differential output amplifier shown in the figure.



4. a) Give the applications of Schmitt trigger.
- b) Write the limitations of op-amp as comparator?
- c) Write a short note on types of Clipper.
- d) Explain the operation of zero crossing detector circuit with proper waveforms.

OR

Explain voltage to current converter and current to voltage converter with neat circuit diagram.

5. a) What do you mean by a Band-Pass Filter?
- b) Draw the Magnitude and frequency response of Butterworth 1st order low pass filter.
- c) Write a short note on All pass filters.
- d) Explain how Fixed Voltage regulator IC works. Explain the operation of IC 78XX and IC 79XX voltage regulator.

OR

Write short notes on (any one):

- i) AGC using OP-AMP
- ii) Frequency Shift keying
