# **MAHATMAGANDHI INSTITUTE OF TECHNOLOGY**

**Gandipet, Hyderabad- 500 075**

**Branch:2ECE**

**Subject: LICA**



1. a) Derive the expression for voltage gain, input impedance output impedance for dual input balanced output differential amplifier.   
   b) Mention the methods to improve the input impedance of a differential amplifier.

1. a) What are the different linear IC packages?  
   b) Define the terms CMRR, Slew rate, PSSR.  
   c) For an op-amp, PSSR = 70dB, CMRR = 105, differential mode gain Ad = 105 the output voltage changes by 25V in 5μsec.

Calculate:   
i) Numerical value of PSSR.  
ii) Common mode gain.  
iii) Slew rate of an op-amp.

1. a) What are the important features of an instrumentation amplifier?  
   b) Derive the output voltage expression for an instrumentation amplifier using transducer bridge.
2. a) Draw the basic circuit diagram of an op-amp based differentiator and explain its operations and stability.

b) Design a differentiator to differentiate an input signal that varies in frequency

from 10Hz to about 1KHz.

1. a) What is a comparator. With neat circuit diagram explain the operation of a

zero crossing detector and draw the input and output waveforms  
b) Draw the non-inverting summing amplifier and derive the expression for output voltage.

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