Name of subject: Linear Integrated circuits
Subject code: 17445
Semester: IV

<p align="center">Question Bank</p>

Chapter 1:
3 Marks Question:
1. Define CMRR, Slew Rate, Gain Bandwidth Product
2. Define Input Offset voltage, Output Offset Voltage, PSRR.
3. Draw equivalent circuit of an op-amp & explain.
4. Draw voltage transfer characteristics of an op-amp & explain.

4 Marks Question:
1. Draw the block diagram of an op-amp and write the function of each block.
2. What is the use of level shifter stage? Draw its circuit diagram.
3. Write ideal and practical values of any four characteristics of an op –amp.
4. Assuming slew rate for 741 is 0.5 V/μsec. What is the maximum frequency of undistorted sine wave that can be obtained for 1. 12V peak   2. 2V peak

Chapter 2:
3 Marks Question:
1. Distinguish open loop and close loop configuration. (6 pts.)
2. Describe the concept of virtual ground and virtual short.
3. Why open loop configuration is not used for linear applications?
4. Draw the unity gain amplifier. State any two applications of it.
5. Draw the input and output waveform of practical integrator when the input is sine wave, square wave.
6. Draw the input and output waveform of practical differentiator when the input is sine wave, square wave.
7. In an inverting amplifier let R_F = 100 KΩ , R_1 = 10KΩ and V_1 = 1V calculate
8. Input current b. Output Voltage   c. Closed loop gain

4 Marks Question:
1. Draw the circuit diagram of close loop non- inverting amplifier and derive expression of its voltage gain.
   a.
2. Design the circuit to get output voltage Vo = 5V and draw designed circuit.
3. It is desired to get an output using op-amp, given by the equation Vo= $5(V_1-V_2)+3V_3$ Design the circuit and draw the designed circuit.

4. Draw the circuit of closed loop difference amplifier using one op-amp. Derive the expression of its output voltage.
5. Draw the circuit diagram of basic integrator and practical integrator.
6. Draw the circuit diagram of basic differentiator and derive expression of its output voltage.

Chapter 3:
3 Marks Question:
1. Draw the block diagram of an instrumentation amplifier.
2. Draw and explain temperature compensated logarithmic amplifier using op-amp.
3. Draw the circuit diagram of I. A. using three op – amp and write its output equation.

4 Marks Question:
1. Draw the circuit of a V-I converter and derive an expression for the output current in terms of input voltage.
2. Draw the diagram of log amplifier using op-amp. Derive the expression for its output voltage.
3. Draw the sample and hold circuit using op-amp. Explain its working and show input and output waveform.
4. Draw the neat diagram of analog multiplier using log-antilog amplifiers and explain its operation.
5. Derive output voltage equation for instrumentation amplifier using two op-amp