

Question Bank (G scheme)

Name of subject: LINEAR INTEGRATED CIRCUITS

Subject code: 17445

Semester :IV

Unit Test : I

Course : IS/IE/EJ

CHAPTER 1: OPERATIONAL AMPLIFIER(10 MARKS)

3 Marks :

- 1) Define CMRR, Slew Rate, Gain Bandwidth Product
- 2) Define Input Offset voltage, Output Offset Voltage, PSRR.
- 3) Draw equivalent circuit and voltage transfer characteristics of an op-amp.

4 Marks :

- 4) Draw the block diagram of an op-amp and write the function of each block.
- 5) What is the use of level shifter stage? Draw its circuit diagram.
- 6) Write ideal and practical values of any four characteristics of an op –amp.
- 7) Assuming slew rate for 741 is $0.5 \text{ V}/\mu\text{sec}$. What is the maximum frequency of undistorted sine wave that can be obtained for a. 12V peak b. 2V peak

CHAPTER 2: OP AMP CONFIGURATION(18 MARKS)

3 Marks :

- 8) Distinguish open loop and close loop configuration. (6 pts.)
- 9) Describe the concept of virtual ground and virtual short.
- 10) Why open loop configuration is not used for linear applications?
- 11) Draw the unity gain amplifier. State any two applications of it.
- 12) Draw the input and output waveform of practical integrator and differentiator when the input is sine wave and square wave.
- 13) In an inverting amplifier let $R_F = 100 \text{ K}\Omega$, $R_1 = 10\text{K}\Omega$ and $V_1 = 1\text{V}$ calculate
a. Input current b. Output Voltage c. Closed loop gain

4 Marks Question:

- 14) Draw the circuit diagram of close loop non- inverting amplifier and derive expression of its voltage gain.
- 15) Design the circuit to get output voltage $V_o = 5\text{V}$ and draw designed circuit.
- 16) It is desired to get an output using op-amp, given by the equation $V_o = 5(V_1 - V_2) + 3V_3$

Design the circuit and draw the designed circuit.

- 17) Draw the circuit of closed loop difference amplifier using one op-amp. Derive the expression of its output voltage.
- 18) Draw the circuit diagram of basic integrator and practical integrator.

19) Draw the circuit diagram of basic differentiator and derive expression of its output voltage.

CHAPTER 3: APPLICATIONS OF OP AMP(22 MARKS)

3 Marks:

- 20) State the need of signal conditioning.
- 21) Draw and explain temperature compensated logarithmic amplifier using op-amp.
- 22) Draw the circuit diagram of I. A. using three op – amp and write its output equation.
- 23) Explain current to voltage converter. Write its applications.
- 24) Draw and explain Window detector.
- 25) Compare between Schmitt Trigger and Comparator.
- 26) Define UTP, LTP, Hysteresis with respect to Schmitt trigger

4Marks :

- 27) Draw the circuit of a V-I converter and derive an expression for the output current in terms of input voltage.
- 28) Draw the diagram of log amplifier using op-amp. Derive the expression for its output voltage.
- 29) Draw the sample and hold circuit using op-amp. Explain its working and show input and output waveform.
- 30) Draw the neat diagram of analog multiplier using log-antilog amplifiers and explain its operation.
- 31) Draw and explain zero crossing detector with i/p and o/p waveform.
- 32) Draw and explain Inverting Schmitt Trigger using IC 741.
- 33) With suitable circuit diagram explain Active peak detector.