

## Question Bank (I- scheme)

**Name of Course:** LINEAR INTEGRATED CIRCUIT

**Course code:** (22423)

**Unit Test: I**

**Semester:**IV

**Course - LIC**

**Programme :** EJ

### **Unit 1 Fundamentals of Operational Amplifier (8M)**

#### **2 Marks Questions**

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. Distinguish open loop and close loop configuration. (4 points.)
5. Explain why open loop configuration is not used for linear applications.
6. Draw and label the symbol of OP-AMP.
7. Draw ideal and practical transfer characteristic of OP-AMP.

#### **4 Marks Questions**

8. Draw the block diagram of an op-amp and write the function of each block.
9. What is the use of level shifter stage? Draw its circuit diagram.
10. Write ideal and practical values of any four characteristics of an op –amp.
11. 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
12. Describe the concept of virtual ground and virtual short.

### **Unit 2 Applications of Operational Amplifier ( 12M)**

#### **2 Marks Questions**

13. Draw the unity gain amplifier. State any two applications of it.
14. Draw the circuit of OP-AMP with feedback in inverting mode. Give expression for output.

15. Draw the circuit diagram and output voltage relation for inverting summing amplifier.
16. Draw the circuit diagram of Op-Amp as a subtractor and write the equation for output voltage.
17. Compare active Integrator and active differentiator (any 4 points).

#### **4 Marks Questions**

18. Draw the circuit diagram of basic integrator and practical integrator with its input and output waveforms.
19. Draw the circuit diagram of basic differentiator and derive expression of its output voltage.
20. Draw the circuit of closed loop difference amplifier using one op-amp. Derive the expression of its output voltage
21. Design the circuit to get the output voltage using op-amp, given by the equation  $V_o = -(2V_1 + 3V_2 + 5V_3)$
22. If  $R_1 = 3K\Omega$ ,  $R_f = 120K\Omega$ ,  $V_{cc} = \pm 15V$  and RMS input  $V_1 = 50mV$ , calculate output voltage in inverting and non-inverting amplifier of op-amp.
23. Explain the concept of frequency compensation and offset nulling.

### **Unit 3 Linear Applications of Op-Amp (15 M)**

#### **2 Marks Questions**

24. State the need of signal conditioning
25. Draw the circuit diagram of Instrumentation Amplifier using three op – amp and write its output equation.
26. Draw voltage to current converter with grounded load.
27. List two applications of current to voltage converter.

#### **4 Marks Questions.**

28. Draw the circuit of a V-I converter and derive an expression for the output current in terms of input voltage.
29. Explain current to voltage converter. Write its applications
30. Describe the operation of Instrumentation Amplifier using two op-amp with neat diagram.

