

**DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/
MANAGEMENT/COMMERCIAL PRACTICE, APRIL - 2024**

LINEAR INTEGRATED CIRCUITS

[Maximum Marks:75]

[Time: 3 Hours]

PART - A

I. Answer all the following questions in one word or one sentence. Each question carries 'one' marks.

(9 x 1 = 9 Marks)

Module Outcome Cognitive level

1	Define input offset voltage of an op amp.	M1.03	R
2	Draw the voltage transfer curve of op amp.	M1.02	R
3	Write the use of a zero crossing detector circuit.	M2.04	R
4	Write the application of clamper circuit.	M2.02	R
5	Write the application of Schmitt trigger circuit.	M2.04	R
6	What is the expression for time period of astable and monostable circuits using IC 555.	M3.02	R
7	What is the basic use of a PLL circuit in a communication receiver.	M3.03	R
8	Write the function of a voltage regulator IC.	M4.01	R
9	Write the use of a DAC.	M4.03	R

PART - B

II. Answer any eight questions from the following. Each question carries 'Three' marks.

(8 x 3 = 24 Marks)

Module Outcome Cognitive level

1	Draw the inverting, non-inverting and differential amplifier configurations of op amp in open loop.	M1.04	R
2	Draw and explain op amp voltage follower circuit.	M1.04	U
3	Explain the concept of virtual ground with an op-amp circuit.	M1.04	U
4	Explain the working of RC phase shift oscillator using op-amp with circuit diagram.	M2.03	U
5	Draw the circuit and frequency response of first order active low pass filter using op amp.	M2.05	R
6	Model the output waveform for the given circuit if the input V_i is a 10Vpp sine wave. Explain the working of the circuit and outline the input and out wave forms.	M2.04	A

7	Outline the pin diagram of IC555 and explain the function of each pin.	M3.02	R
8	Outline a block diagram to show how PLL can be used as a frequency multiplier.	M3.04	R
9	Construct a circuit using IC555 to generate a pulse train with ON time = 1 ms and OFF time = 0.5ms	M3.02	A
10	Explain the working principle of opto-coupler with a diagram.	M4.01	U

PART - C

Answer all the questions from the following. Each question carries 'seven' marks.

(6 x 7 = 42 Marks)

Module Outcome Cognitive level

III.	Draw and explain the block diagram of operational amplifier. OR	M1.02	U
IV.	Sketch the circuit diagram of a non-inverting amplifier using op-amp and derive the expression for voltage gain.	M1.04	U
V.	Construct an op amp circuit to realize the equation $V_0 = [V_1 + V_2 + V_3]$ OR	M2.01	A
VI.	Construct a positive clipper using op amp to clip a sine wave at +3V. Explain the working of the circuit and plot input and output waves.	M2.02	A
VII.	Explain the operation of Schmitt trigger using op amp circuit. Plot the input and out waveforms. OR	M2.04	U
VIII.	Explain the operation of op amp monostable multivibrator using circuit diagram and wave forms.	M2.03	U
IX.	Draw and explain the functional block diagram of 555 timer. OR	M3.01	U
X.	Draw and explain FM demodulator circuit using PLL IC LM565.	M3.04	U
XI.	Draw and explain the basic low voltage regulator circuit using LM 723. OR	M4.01	U
XII.	Explain the working of flash ADC with a diagram.	M4.02	U
XIII.	Explain the working of weighted resistor DAC with a diagram. OR	M4.03	U
XIV.	Explain the working of successive approximation ADC with a diagram.	M4.02	U
