B.E. / B.Tech. - DEGREE EXAMINATIONS, NOV / DEC 2025

Fourth Semester

Electronics and Communication Engineering

20ECPW402 - LINEAR INTEGRATED CIRCUITS WITH LABORATORY

Regulations - 2020

Duration: 3 Hours

Max. Marks: 100

PART - A (MCQ) (10 × 1 = 10 Marks)
Answer ALL Questions

		Marks	K–Level	CO

1. Slew rate is defined as the rate of change of _____. — 1, K1, CO1
   (a) Output voltage with respect to time (b) Input voltage with respect to time
   (c) Both output input voltage with respect to time (d) None of the mentioned

2. Which of the following electrical characteristics is not exhibited by an ideal op-amp? — 1, K1, CO1
   (a) Infinite voltage gain (b) Infinite bandwidth
   (c) Infinite output resistance (d) Infinite slew rate

3. The circuit in which the output voltage waveform is the integral of the input voltage waveform is called _____. — 1, K1, CO2
   (a) Integrator (b) Differentiator
   (c) Phase shift oscillator (d) Square wave generator

4. Which application use differentiator circuit? — 1, K1, CO2
   (a) None of the mentioned (b) FM modulators
   (c) Wave generators (d) Frequency Shift keying

5. Choose the op-amp that improves the filter performance. — 1, K1, CO3
   (a) μA741 (b) LM318 (c) LM101A (d) MC34001

6. Which circuit can be used to take square root of a signal? — 1, K1, CO3
   (a) Divider circuit (b) Multiplier circuit (c) Squarer circuit (d) None of the mentioned

7. At which state the phase-locked loop tracks any change in input frequency? — 1, K1, CO4
   (a) Free running state (b) Capture state (c) Phase locked state (d) All of the mentioned

8. The practical use of binary-weighted digital-to-analog converters is limited to _____. — 1, K1, CO4
   (a) 4-bit D/A converter (b) 8-bit D/A converter
   (c) R-2R Ladder D/A converter (d) op-amp comparator

9. How many control lines are present in analog to digital converter in addition to reference voltage? — 1, K1, CO4
   (a) Three (b) Two (c) One (d) None of the mentioned

10. Which filter type is called a flat-flat filter? — 1, K1, CO6
    (a) Cauer filter (b) Butterworth filter (c) Chebyshev filter (d) Band-reject filter

PART - B (12 × 2 = 24 Marks)
Answer ALL Questions

11. Why is the slew rate infinite in ideal op-amp? — 2, K1, CO1

12. Find the maximum frequency for a sine wave output voltage of 12v peak with an OP-AMP whose slew rate is 0.5V/ μs. — 2, K2, CO1

13. What is the function of a phase shift circuit? — 2, K1, CO2

14. How are the current characteristics of PN junction employed in log amplifier? — 2, K1, CO2

15. Define Capture range, Lock in range, Pull in time. — 2, K1, CO3

16. List the basic building block of a PLL. — 2, K1, CO3

17. What are the drawbacks of binary weighted resistor D/A converter? — 2, K1, CO4

18. Define settling time. — 2, K1, CO4

K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze; K5 – Evaluate; K6 – Create

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19. What is the necessity of having input and output capacitors in three terminal IC regulators?	2	K1 CO5
20. List the various application of Multivibrator	2	K1 CO5
21. What are an isolation amplifier and its application's?	2	K1 CO6
22. List the advantage of a switched capacitor filter.	2	K1 CO6

PART - C (6 × 11 = 66 Marks)
Answer ALL Questions

23.	a) Explain about Ideal Op-Amp with suitable diagrams.	11	K2 CO1
	OR		
	b) Draw the transfer characteristics of an operational amplifier and explain the linear and non-linear operation.	11	K2 CO1
24.	a) (i) Explain the operation of precision full wave rectifier with neat sketch.	7	K2 CO2
	(ii) Illustrate the working of voltage to current converter.	4	K2 CO2
	OR		
	b) Interpret the circuit that performs the mathematical operation of differentiation. Draw its output waveform.	11	K2 CO2
25.	a) Illustrate the working of analog multiplier using emitter coupled transistor pair.	11	K2 CO3
	OR		
	b) Explain the application of PLL as AM Detector and FSK Demodulator.	11	K2 CO3
26.	a) Explain in detail on the operational features of 4 – bit weighted resistor type D/A converter.	11	K2 CO4
	OR		
	b) With neat sketch explain the working of a flash type ADC.	11	K2 CO4
27.	a) Compare the working of astable and monostable multi vibrator using IC555 timer.	11	K2 CO5
	OR		
	b) Explain the working principle of Triangular wave generator circuit using op-amp and mention its application.	11	K2 CO5
28.	a) With a neat circuit diagram, explain the working of linear voltage regulator using operational amplifier.	11	K2 CO6
	OR		
	b) Explain the following ICs function and application of Audio Power Amplifier.	11	K2 CO6