R22 Regulation *Subject code:4E4DD*

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

(Autonomous, Accredited by NAAC with 'A+' Grade)

B.Tech IV Semester Regular/Supplementary Examinations, June 2026

LINEAR AND DIGITAL IC APPLICATIONS

(ECE)

Maximum Marks: 60 Date:15.06.2026 Duration: 3 hours

Note:
1. **This question paper contains two parts A and B.**
2. **Part A is compulsory which carries 10 marks. Answer all questions in Part A.**
3. **Part B consists of 5 Units. Answer any one full question from each unit.**
4. **Each question carries 10 marks and may have a, b, c, d as sub questions.**

Part-A

All the following questions carry equal marks (10X1M=10 Marks)		Marks	CO	Bloom Tx
1.a)	What is slew rate?	1M	1	L1
b)	List the important features of IC 741 Operational Amplifier.	1M	1	L1
c)	Define the stable and quasi stable state.	1M	2	L1
d)	List the applications of IC 555 timer.	1M	2	L1
e)	Write the function of a Phase Locked Loop (PLL).	1M	3	L1
f)	Differentiate between ADC and DAC.	1M	3	L2
g)	Write the function of a CMOS transmission gate.	1M	4	L1
h)	Differentiate between TTL and CMOS logic families.	1M	4	L2
i)	Differentiate between ROM and RAM memories.	1M	5	L2
j)	Define a flip-flop and mention its applications.	1M	5	L1

Part-B

Answer All the following questions. (5X10M=50Marks)		Marks	CO	Bloom Tx
2	a) Explain the why emitter follower circuit is used as level shifter. b) Design an Op-amp differentiator to differentiate an input signal that varies in frequency from 10Hz to about 1 KHz.	5M 5M	1	L2
	OR			
3	a) An IC Op-amp 741 used as an inverting amplifier with a gain of 100. The voltage gain vs frequency characteristic is flat up to 12 kHz. Find the maximum peak to peak input signal that can be feed without causing any distortion to the output. b) Draw and explain the output waveform of the ideal inverter circuit when the input is square wave.	5M 5M	1	L2
4	Explain the operation of Monostable multi vibrator using 555 timers. Derive the expression of time delay of mono stable multi vibrator with 555 timers.	10M	2	L3
	OR			
5	Describe the generation of triangular, sawtooth, and square waveforms using Op-Amp circuits.	10M	2	L2

6	Draw the block schematic of IC565 PLL and explain the function of each block in detail.	10M	3	L2
	OR			
7	a) Explain the operation of Successive Approximation ADC with suitable waveforms and applications. b) Explain the working principle of a R-2R Ladder type D/A converter.	5M 5M	3	L2
8	What are code converters? Design binary to BCD and BCD to binary code conversion modules.	10M	4	L2
	OR			
9	a) Design a Priority encoder circuit and which 74XX series IC is used for it. b) Develop a 4-bit Magnitude Comparator using 74XX series IC.	5M 5M	4	L3
10	Explain the working of decade counters and design a MOD-10 counter using suitable ICs.	10M	5	L2
	OR			
11	a) Describe the operation of shift registers and explain different types of shift registers with suitable examples. b) Illustrate the architecture of SRAM and explain its operation.	5M 5M	5	L2