



R20 Regulation

Subject code: 3E7DA

# TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

B.Tech VII Semester Supplementary Examinations, November 2025

## ANALOG IC DESIGN (ECE)

Maximum Marks: 70

Date: 01.12.2025

Duration: 3 hours

- Note:
1. This question paper contains two parts A and B.
  2. Part A is compulsory which carries 20 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 (10X2M=20 Marks)		Marks	CO	BTL
1	What is body effect?	2M	1	L1
2	Write the conditions of MOS transistor to operate in saturation and non-saturation regions.	2M	1	L1
3	Draw the MOS implementation of current source.	2M	2	L1
4	Define sensitivity of a voltage reference.	2M	2	L1
5	Define ICMR.	2M	3	L1
6	Draw the circuit of single ended input current amplifier.	2M	3	L1
7	Define Unity Gain Bandwidth.	2M	4	L1
8	Categorize the CMOS operational amplifiers.	2M	4	L1
9	Draw the model for ideal comparator.	2M	5	L1
10	What is clamped comparator?	2M	5	L1

### Part-B

Answer All the following questions. (5X10M=50Marks)		Marks	CO	BTL
11	Draw and explain the various components of large signal model of a MOS Transistor.	10M	1	L2
OR				
12	With the help of required expressions explain Sub-threshold MOS Model.	10M	1	L2
13	Write short notes on current sinks and sources.	10M	2	L2
OR				
14	Explain in detail about Current and Voltage References.	10M	2	L2
15	What is the need of high gain? Draw and explain the operation of high gain amplifiers architectures.	10M	3	L2
OR				
16	Explain the operation of active load inverter and obtain small signal output resistance.	10M	3	L2
17	Explain about the design of CMOS op amps.	10M	4	L2

OR				
18	Explain the miller compensation in two stage op-amps.	10M	4	L2
19	What is a comparator? Explain the static and dynamic characteristics of a comparator.	10M	5	L2
OR				
20	Explain the auto zeroing concept of improving the performance of a comparator.	10M	5	L2