R17 Regulation *Subject code:* 1E7DG

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

B.Tech IV Year I Semester Regular Examinations, February 2021

CMOS ANALOG INTEGRATED DESIGN

(Electronics and Communication Engineering)

Maximum Marks: 70 Date: 02.03.2021 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)**

1 Sketch the schematic of a modern pMOSFET.
2 Define threshold voltage of MOSFET..
3 List the types of Current Sources.
4 What is basic principle of Current mirror?
5 Compare the Voltage and Current Gain of Differential Amplifier and Cascode Amplifier.
6 What are High Gain Amplifiers?
7 Write down the characteristics of Op Amp.
8 Define Power Supply Rejection Ratio.
9 List few applications of Comparator.
10 What are the advantages of Discrete Time Comparators?

Part-B

Answer All the following questions. **(10M X 5=50Marks)**

11 Derive the expression for the threshold voltage of a MOS transistor and explain the significance of different parameters present in the equation. (10M)

OR

12 With relevant expressions explain about sub-threshold MOS models. (10M)

13 Explain Current mirror with neat diagram and explain the general properties of Current mirror. (10M)

OR

14 a)Derive the expression for Wilson current mirror circuit. (5M)
b) Compare Current and Voltage References. (5M)

15 Explain about current mirror load Differential Amplifier with neat diagram. (10M)

OR

16 Write notes on i) Cascode Amplifiers and ii) Current Amplifiers (10M)

17 Explain design procedure of Two Stage Op Amp. (10M)

OR

18 Derive the expression for Power supply rejection ratio of two stage Op Amp. (10M)

19 a) List the characteristics of a Comparator. (5M)
b) Explain how to improve the performance of Open loop Comparator. (5M)

OR

20 a)Differentiate Two Stage Comparator and Discrete Time Comparator. (5M)
b) Explain about different types of Open loop comparator. (5M)