Roll No											

PRESIDENCY UNIVERSITY
BENGALURU

SCHOOL OF ENGINEERING
END TERM EXAMINATION - JUN 2023

Semester : Semester VI - 2020
Course Code : ECE3046
Course Name : Sem VI - ECE3046 - Low Power Vlsi Design
Program : ECE

Date : 16-JUN-2023
Time : 9.30AM - 12.30PM
Max Marks : 100
Weightage : 50%

Instructions:
(i) Read all questions carefully and answer accordingly.
(ii) Question paper consists of 3 parts.
(iii) Scientific and non-programmable calculator are permitted.
(iv) Do not write any information on the question paper other than Roll Number.

PART A

ANSWER ALL THE QUESTIONS **(5 X 2 = 10M)**

1. The NMOS and PMOS size is changed for adjusting the rise and fall time of the circuit. Perform transistor sizing of 2-input NOR gate.
(CO1) [Knowledge]
2. State machine encoding is one of the low power techniques at a circuit level. What is state machine encoding?
(CO1) [Knowledge]
3. Gate level simulation is an important aspect of VLSI design flow. Illustrate GLS.
(CO1) [Knowledge]
4. The power is dissipated in the form of heat in electronic or electrical circuits. What are the three main components of average power dissipation?
(CO1) [Knowledge]
5. The single driver and distributed buffers are used in clock circuits. Differentiate single driver and distributed buffers.
(CO1) [Knowledge]

PART B

ANSWER ALL THE QUESTIONS **(2 X 15 = 30M)**

6. The power is dissipated when there is a direct path from the power supply to the ground. (i) Describe short circuit power dissipation. (ii) Derive the expression for short circuit power dissipation.
(CO1,CO2) [Comprehension]

7. The Latch and Flip flop are the first and last elements of any circuit. Describe (i) Self-gating flip flop. (ii) Combinational flip flop and (iii) Double edge triggered flip flop.

(CO2) [Comprehension]

PART C

ANSWER ALL THE QUESTIONS **(3 X 20 = 60M)**

8. The control data flow graph is starting to derive DSP hardware implementation. (i) Draw the control data flow graph for Yn= anbn+3an-1 and illustrate the flow graph transformation (ii) Discuss the importance of operator reduction with suitable example.

(CO4) [Application]

9. (i) The capacitance is one of the important parameters of average power dissipation. Describe capacitive power dissipation.
(ii) The glitch power dissipation is reduced by using the pipelining technique. Illustrate the importance of pipelines in low-power design with an example.

(CO2) [Application]

10. (i) Design any precomputation logic circuit and describe it. (ii) Discuss the importance of signal gating in low-power VLSI design.

(CO3) [Application]