Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

Fourth Semester B.Tech Degree (S, FE) Examination May 2023 (2015 Scheme)

Course Code: EC212

Course Name: LINEAR INTEGRATED CIRCUITS AND DIGITAL ELECTRONICS (MC)

Max. Marks: 100 Duration: 3 Hours

PART A

Answer all the questions below; each one carries 5 marks. *Marks*

1 Define the following terms and explain their significance in practical circuits (5)

(i) Input offset Voltage (ii) CMRR

2 What is an isolation amplifier? Explain its applications. (5)

3 Design a first-order low pass filter of cut-off frequency 2 KHz with a passband gain of 1. (5)

4 State and prove the De Morgan's Theorem. (5)

5 Design and implement a full adder with minimum number of gates. (5)

6 Compare the characteristics of SRAM and DRAM. (5)

7 Categorize the different types of shift registers. Explain any one of them. (5)

8 Explain the importance of master-slave FFs with an example. (5)

PART B

Answer any three full questions; each carries 10 marks.

9 With the help of a neat circuit diagram, derive an equation for frequency response to show that the stability and low frequency roll-off problems can be corrected using a practical integrator. (10)

10 (a) Explicate the threshold levels of a regenerative comparator with necessary diagrams. (5)

(b) Draw the circuit diagram and waveform of a Sample & Hold circuit using op-amp. Explain its working. (5)

11 (a) Illustrate the working principle of an 8-bit successive approximation A/D converter. (6)

(b) Distinguish Butterworth filter from Chebyshev filter. (4)

12 Minimize the following function using Karnaugh map (10)

$F(A,B,C,D) = \Sigma m(0,1,3,5,7,8,9,11,13,15)$

13 Elucidate the working of an Astable multivibrator with a circuit diagram and waveform. (10)

PART C

Answer any two full questions; each carries 15 marks.

14 Solve F(A,B,C) = Σm(0,1,5,6,7) using 4x1 MUX with (15)

(i) AB as select lines

(ii) AC as select lines

15 Design and implement a 3-bit gray to binary code converter. (15)

16 Discuss on Ring counters and Johnson counters. (15)

17 Design and implement a mod-6 asynchronous counter using T–FFs. (15)

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