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Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

Third Semester B.Tech Degree Regular and Supplementary Examination December 2023 (2019 Scheme)

Course Code: MRT203

Course Name: ANALOG AND DIGITAL ELECTRONICS

Max. Marks: 100 Duration: 3 Hours

PART A

Answer all questions. Each question carries 3 marks Marks

1	Differentiate between BJT and FET.	(3)
2	"Positive feedback is used in oscillators". Justify your answer.	(3)
3	List the characteristics of ideal op amp.	(3)
4	Explain schmitt trigger with neat circuit diagram.	(3)
5	Discuss on active low pass filter.	(3)
6	Explain about Voltage Controlled oscillator.	(3)
7	State and prove De-Morgan's theorem.	(3)
8	Simplify the Boolean expression $Y=\sum m(8,9,10,11,12,14)$	(3)
9	Compare combinational and sequential circuits.	(3)
10	What is race around condition? How it is eliminated?	(3)

PART B

Answer any one full question from each module. Each question carries 14 marks

Module 1

11	a) Explain the construction and principle of E-MOSFET with necessary diagrams.	(10)
	b) Comment on Barkhausen criteria.	(4)
12	Explain RC Phase shift oscillator and derive the expression for frequency of oscillation.	(14)

Module 2

13	a) Draw the functional block diagram of OP AMP and explain each block.	(8)
	b) Sketch the basic circuit using OP AMP to perform the mathematical operation of differentiation and explain.	(6)

14	Illustrate the following		(14)
	a)	V-I converter	
	b)	I-V converter	
	c)	Isolation amplifier	

Module 3

15	a)	Explain Astable multivibrator using IC 555.	(8)
	b)	Explain in detail about any one application of PLL	(6)
16	a)	Write a note Band Stop Filter with neat diagram	(6)
	b)	Explain PLL with the help of neat block diagram	(8)

Module 4

17	Using Quine McCluskey method simplify $f=\sum m(0,1,6,7,8,9,13,14,15)$		(14)
18	a)	Design a 3 bit binary to gray code converter.	(10)
	b)	Design a half adder circuit using logic gates.	(4)

Module 5

19	Design a 3-bit synchronous UP counter using JK flip-flop.	(14)
20	Design a mod 6 asynchronous counter.	(14)

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