0800MRT203122002

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Name:

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

B.Tech Degree S3 (S,FE) Examination May 2025 (2019 Scheme)

Course Code: MRT203

Course Name: ANALOG AND DIGITAL ELECTRONICS

Max. Marks: 100

Duration: 3 Hours

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Pages: 2

	PART A Answer all questions. Each question carries 3 marks	Marks
1	What is the pinch off region in a JFET? Explain.	(3)
2	Differentiate between Class AB and Class B power amplifier.	(3)
3	With circuit diagram explain I to V converter	(3)
4	State the characteristics of the ideal Op-amp	(3)
5	Describe the role of Voltage controlled oscillator in PLL.	(3)
6	Draw the frequency response curve for low pass, high pass, band pass and band stop filters.	(3)
7	Design a Half subtractor circuit with explanation.	(3)
8	Summarize the following logic gates a) NAND gate b) NOR gate c) EXOR gate	(3)
9	Give a brief description about race around condition occurring in Flip Flops	(3)
10	Explain how a binary data is transmitted in a Parallel-in-Parallel-out (PIPO) shift register with example.	(3)
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PART B

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

Module 1

- a Explain with a neat circuit diagram the working of a N channel (10) Enhancement MOSFET.
 - b Draw the drain or output Characteristic curve of N channel enhancement (4) type MOSFET and explain briefly.
- 12 Elucidate the working of RC phase shift oscillator. Derive an expression for (14) the frequency of RC oscillator.

Module 2

- 13 a With neat sketch explain voltage series & voltage shunt feedback amplifier (14)
- 14 a Show that Schmitt Trigger circuit using op-amp exhibits a phenomenon (8)

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called hysteresis.

	b	With neat sketch and waveform discuss how op-amp can be used as	(6)
		differentiator circuit.	
		Module 3	
15	a	Elaborate the operation of PLL with basic blocks.	(5)
	b	Using internal circuitry explain the working of monostable multivibrator using IC 555.	(9)
16	a	Discuss briefly about the application of PLL as frequency multiplier.	(7)
	b	Write a short note on band stop filter using op-amp.	(7)
		Module 4	
17		Minimize the below Boolean function, using Quine-McCluskey or tabular method	(14)
		$f(A,B,C,D) = \sum m(2,6,8,9,10,11,14,15)$	
18		Design a gray to binary code converter with the help of truthtable.	(14)
		Module 5	
19		Design a sequence detector that produces an output "1" whenever the non- overlapping sequence 1111 is detected	(14)
20	а	Design a 4-bit ring counter using D flip flop and explain briefly.	(7)

b Explain with suitable diagram a Parallel-In-Serial-Out (PISO) Shift Register (7)
