Enrolment No./Seat No_____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE- SEMESTER– III EXAMINATION – SUMMER 2026

Subject Code:3130907 Date:19-06-2026

Subject Name:Analog & Digital Electronics

Time:02:30 PM TO 05:00 PM Total Marks:70

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**
4. **Simple and non-programmable scientific calculators are allowed.**

			Marks
Q.1	**(a)**	Define following terms: 1. Output offset voltage, 2. Input bias current, 3. Input offset current,	**03**
	(b)	Describe block diagram of OPAMP.	**04**
	(c)	Describe J-K Master Slave flip flop with necessary truth table.	**07**
Q.2	**(a)**	Compare inverting and non inverting amplifier.	**03**
	(b)	Describe instrumentation amplifier using OPAMP	**04**
	(c)	Explain inverting circuit using OPAMP with necessary equations and waveforms.	**07**
		OR	
	(c)	Explain non-inverting circuit using OPAMP with necessary equations and waveforms.	**07**
Q.3	**(a)**	Discuss zero crossing detector using OPAMP	**03**
	(b)	Classify active filter.	**04**
	(c)	Describe integrator circuit with necessary waveforms.	**07**
		OR	
Q.3	**(a)**	Discuss peak detector using OPAMP	**03**
	(b)	Discuss PID controller with necessary sketches.	**04**
	(c)	Describe wein bridge oscillator circuit with necessary waveforms.	**07**
Q.4	**(a)**	What is an encoder? How does a priority encoder differ from a conventional encoder?	**03**
	(b)	How do you characterize or define a combinational circuit? How does it differ from a sequential circuit?. Give one example of combinational circuit	**04**
	(c)	Calculate following with help of K-Map and implement the output with necessary circuit. $y=\Sigma m\ (0,1,3,5,9,12)+ d(2,4,6,7)$	**07**
		OR	
Q.4	**(a)**	What is a demultiplexer and how does it differ from a decoder?	**03**
	(b)	Briefly describe the concept of look-ahead carry generation with respect to its use in adder circuits.	**04**
	(c)	Calculate the following with help of Quine McClukey tabular method.: $Y=\Sigma\ (2,6,8,9,10,11,14,15)$	**07**
Q.5	**(a)**	Define following terms with respect to A to D converter: 1. Resolution 2. Accuracy 3. Sampling frequency	**03**
	(b)	Elaborate full adder circuit with truth table.	**04**
	(c)	Explain the process of digital-to-analogue conversion in a binary ladder	**07**

network. Write an expression for the output analogue voltage for an n-bit binary ladder network.

OR

Q.5	**(a)**	Define following terms with respect to D to A converter: 1. Settling time 2. Nonlinearity 3. Monotonocity	**03**
	(b)	Elaborate full subtractor circuit with truth table.	**04**
	(c)	Explain the principle of operation of a simultaneous or flash-type A/D converter. What are the merits and demerits of this type of converter?	**07**

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