Enrolment No./Seat No_____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–III (NEW) EXAMINATION – SUMMER 2024

Subject Code:3130907 Date:29-06-2024

Subject Name: Analog & Digital Electronics

Time:10:30 AM TO 01:00 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)**	List all ideal characteristics of an Op-Amp.	**03**
	(b)	Classify the types of negative feedback and explain each in brief.	**04**
	(c)	Draw and explain block diagram of a typical OP-AMP	**07**
Q.2	**(a)**	Compare the inverting and non-inverting comparators	**03**
	(b)	Explain how to generate triangular wave using OPAMP	**04**
	(c)	Draw the circuit Op-Amp as a Integrator and explain with necessary waveforms	**07**
		OR	
	(c)	Explain positive peak detector circuit using OPAMP.	**07**
Q.3	**(a)**	Calculate maximum frequency for a sine wave, output voltage of 12 V peak with an OPAMP having slew rate 1 V/μS	**03**
	(b)	Explain the use of external offset voltage compensation circuits in op amps.	**04**
	(c)	Explain the working of J- K flip flop with the help of diagram	**07**
		OR	
Q.3	**(a)**	Reduce the following function using Boolean Algebra's Laws and Theorems **F=AB'C + B + BD' + ABD' + A'C**	**03**
	(b)	Explain the operation of Zero crossing detector.	**04**
	(c)	Describe 3 to 8 line decoder with logic diagram and truth table.	**07**
Q.4	**(a)**	Compare decoder and demultiplexer.	**03**
	(b)	Draw and Explain 4-bit bidirectional Shift Register.	**04**
	(c)	Implement a full adder using 8 : 1 multiplexer.	**07**
		OR	
Q.4	**(a)**	Differentiate the Asynchronous counter and Synchronous counter	**03**
	(b)	Simply the following function using K map and implement using logic gates. $F = \sum m(2,9,10,12,13) + D(15,14)$	**04**
	(c)	Explain full subtractor and construct full subtractor using half subtractors.	**07**
Q.5	**(a)**	Define following specification of ADC i) Resolution ii)Conversion time and iii) Quantization error	**03**
	(b)	Explain R-2R ladder DAC with necessary diagram	**04**
	(c)	Describe operation of D/A converter with binary – weighted resistors	**07**
		OR	
Q.5	**(a)**	Explain terms Accuracy and settling time for DAC	**03**
	(b)	What will be resolution of 4 bit ADC with 5V input? Define quantization error for ADC.	**04**
	(c)	Explain working of successive approximation type ADC	**07**

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