Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–III (NEW) EXAMINATION – SUMMER 2021

Subject Code:3130907 Date:11/09/2021

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)**	Draw transistor C-E amplifier circuit. Draw its ac equivalent circuit.	**03**
	(b)	Sketch the block schematic of a typical operational amplifier and briefly explain the function of each block.	**04**
	(c)	Explain how Op-amp works as summing amplifier.	**07**
Q.2	**(a)**	List applications of instrumentation amplifier.	**03**
	(b)	Explain the following terms. (1) PSRR (2) Input bias current (3) Input offset Voltage (4) CMRR.	**04**
	(c)	Explain in detail voltage follower with its applications.	**07**
		OR	
	(c)	What do you mean by slew rate in an OP-AMP? Also mention about causes of slew rate and explain its significance in applications.	**07**
Q.3	**(a)**	What are the advantages of active filters over passive filters?	**03**
	(b)	Sketch Wein bridge oscillator. Explain working.	**04**
	(c)	Draw the circuit op-amp as differentiator and explain with necessary waveforms.	**07**
		OR	
Q.3	**(a)**	How to detect peak of waveform using OP-AMP?	**03**
	(b)	Compare: Comparator and Schmitt trigger.	**04**
	(c)	Draw and explain the use of op-amp as a zero crossing detector.	**07**
Q.4	**(a)**	Compare SOP and POS.	**03**
	(b)	Write short note on Gray code.	**04**
	(c)	Prove that NAND and NOR gates are universal gates.	**07**
		OR	
Q.4	**(a)**	Design half subtractor logic circuit.	**03**
	(b)	Explain Master-Slave J-K flip-flop configuration.	**04**
	(c)	Simplify the Boolean function F(A,B,C,D) = Σm (2,5,7,8,11,14,15), Σd=(0,3,6,10) using K-map method. Implement using basic logic gates.	**07**
Q.5	**(a)**	Sketch sample and hold circuit and explain its working.	**03**
	(b)	Explain resolution and quantization error in reference to ADC.	**04**
	(c)	Design 4-bit up/down ripple counter.	**07**
		OR	
Q.5	**(a)**	Compare EPROM with FLASH memory.	**03**
	(b)	Explain R-2R ladder DAC with necessary diagram.	**04**
	(c)	Draw 4-bit down counter; explain its working with timing diagram and truth table.	**07**

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