

GUJARAT TECHNOLOGICAL UNIVERSITY**BE- SEMESTER-III (NEW) EXAMINATION – WINTER 2020****Subject Code:3130907****Date:04/03/2021****Subject Name:Analog & Digital Electronics****Time:10:30 AM TO 12:30 PM****Total Marks:56****Instructions:**

1. Attempt any FOUR questions out of EIGHT questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

		MARKS
Q.1	(a) Define Slew Rate, CMRR, & Input Offset Voltage.	03
	(b) Compare inverting and non-inverting op-amps.	04
	(c) Draw & explain in detail the logic diagram & the truth table of clocked SR flip-flop.	07
Q.2	(a) Draw block diagram of an op-amp.	03
	(b) Draw and explain working of zero crossing detector.	04
	(c) List out and discuss all the ideal characteristics of an op-amp.	07
Q.3	(a) For an inverting amplifier, $V_1 = 1V$, $V_2 = 3V$, $V_3 = 2V$ with $R_1 = R_2 = R_3 = 2K\Omega$ and $R_F = 3K\Omega$. Determine the output voltage.	03
	(b) Design an R-C phase shift oscillator to produce a sinusoidal output at 1KHz, using capacitor value $0.01 \mu F$.	04
	(c) Write a short note on instrumentation amplifier using op-amp.	07
Q.4	(a) Explain the application of an op-amp as an integrator.	03
	(b) Design full adder logic circuit using 3 x 8 decoder and OR gates.	04
	(c) Explain the circuit diagram of op-amp as a Peak detector.	07
Q.5	(a) Design D FF using SR FF. Write truth table of D FF.	03
	(b) Minimize following Boolean function using K-map: $F(A,B,C,D) = \Pi M(1, 2, 3, 8, 9, 11, 14) \cdot d(7, 15)$	04
	(c) Given a logic function: $Z = ABC + BC'D + A'BC$.	07
	a) Make a truth table.	
b) Simplify using K-map.		
c) Realize simplified function using NAND gates only.		
Q.6	(a) Minimize following Boolean function using K-map: $Y(A,B,C,D) = \Sigma m(0, 3, 5, 6, 9, 10, 12, 15)$	03
	(b) Implement the following logic function using 8:1 multiplexer: $F(A, B, C, D) = \Sigma m(0, 1, 3, 4, 8, 9, 15)$	04
	(c) Design a 4-bit synchronous down counter using T flip-flops.	07
Q.7	(a) Compare combinational logic circuit with sequential logic circuit.	03
	(b) Draw basic internal structure of 7490 ripple counter IC. Design BCD counter using 7490 IC.	04
	(c) Draw & explain R-2R ladder D/A converter with necessary equations.	07

- Q.8** (a) Draw the logic diagram of 4-bit ripple up counter using JK FFs. **03**
(b) Write a brief note on quantization and encoding. **04**
(c) List out various commonly used A/D converters. Draw & explain Flash A/D converter with necessary decoding table. Also mention pros & cons of the same. **07**
