

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-IV (NEW) EXAMINATION – WINTER 2023****Subject Code:2140910****Date:17-01-2024****Subject Name: 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) Explain the meaning of an active-LOW input gate	03
	(b) Discuss various types of triggering used for digital circuits.	04
	(c) State and prove De Morgan's Theorems with truth tables.	07
Q.2	(a) Convert $(163.875)_{10}$ to binary.	03
	(b) Using 2's complement method add $(-75)_{10}$ to $(+26)_{10}$	04
	(c) Write a short note on Gray code.	07
	OR	
	(c) Explain the working of JK master slave flipflop.	07
Q.3	(a) Explain Ex-OR gate.	03
	(b) Explain NAND and NOR are universal gates.	04
	(c) Discuss working of edge triggered JK flipflop circuit and explain how race around condition is eliminated.	07
	OR	
Q.3	(a) Show that $A[B + \overline{C}(\overline{AB} + A\overline{C})] = AB$	03
	(b) Expand to maxterms and minterms $A(\overline{A} + B)(\overline{A} + B + \overline{C})$	04
	(c) Reduce the following expression using K-map	07
	(i) $f = \sum m(4,5,7,12,14,15) + d(3,8,10)$	
	(ii) $f = \prod M(6,7,8,9) \cdot d(10,11,12,13,14,15)$	
Q.4	(a) State limitations of K maps.	03
	(b) Describe the steps in minimization of function using tabular method.	04
	(c) Find the minimal expression using tabular method for the given function: $f = \sum m(1,2,3,5,6,7,8,9,12,13,15)$	07
	OR	
Q.4	(a) Distinguish between parallel and serial adders	03
	(b) Explain look ahead carry adder circuit.	04
	(c) Describe demultiplexer along with a few applications.	07
Q.5	(a) Distinguish between synchronous and asynchronous counters.	03
	(b) Discuss universal shift registers.	04
	(c) Explain the effects of propagation delay in ripple counters	07
	OR	
Q.5	(a) Define (i) Resolution (ii) Settling time (iii) Monotonicity	03
	(b) Discuss in brief memory organization.	04
	(c) Discuss the working of D/A converter with binary weighted resistors.	07
