

**GUJARAT TECHNOLOGICAL UNIVERSITY****BE - SEMESTER-IV(NEW) – EXAMINATION – SUMMER 2019****Subject Code:2142406****Date:17/05/2019****Subject Name: Digital Electronics and its applications****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.

- Q.1** (a) Explain D'Morgans theorem with truth table. **03**
(b) Fill in the blanks **04**
(1) $(101101)_2 = (\quad)_{10}$
(2) $(55)_{10} = (\quad)_2$
(c) Minimize the following Boolean function using sum of products (SOP): **07**
 $f(a,b,c,d) = \sum m(3,7,11,12,13,14,15)$
- Q.2** (a) What is universal logic gate? Give the name of universal logic gates. **03**
(b) Define Boolean Algebra? Explain Duality Principles with example. **04**
(c) Explain two input (i) AND (ii) OR and (iii) EX-OR gates. **07**
OR
(c) Explain NAND as universal logic gate in detail. **07**
- Q.3** (a) What is K-map? What is disadvantage of K-map method? **03**
(b) Compare Combinational logic and Sequential logic in tabular form. **04**
(c) Design and explain full adder using 3 X 8 decoder. **07**
OR
- Q.3** (a) Design full adder using two half adder. **03**
(b) Write a note on Binary Ripple Counter. **04**
(c) Explain edge-triggered D Flip-flop and SR Flip-flop in detail. **07**
- Q.4** (a) Give the difference between Latch and Flip Flop. **03**
(b) What is race around condition? **04**
(c) Design & explain the block diagram of a 4:1 Multiplexer using 2:1 Multiplexer. **07**
OR
- Q.4** (a) Explain with necessary sketches PLA control. **03**
(b) Design synchronous BCD counter. **04**
(c) Design a circuit for 4-bit bidirectional shift register. **07**
- Q.5** (a) Define state and state diagram. **03**
(b) Compare SRAM & DRAM in all aspects. **04**
(c) Design and explain 3 bit data comparator circuit. **07**
OR
- Q.5** (a) Explain in brief Scratchpad memory. **03**
(b) Explain Accumulator and ALU status register in brief. **04**
(c) Discuss Hardwired vs. Micro-programmed control unit. **07**
