

**GUJARAT TECHNOLOGICAL UNIVERSITY****BE - SEMESTER-IV (NEW) EXAMINATION – WINTER 2018****Subject Code:2142406****Date:05/12/2018****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)** Do as directed: **03**  
 (1)  $(1011.01)_2 = ( \quad )_{10}$  (2)  $(105)_{10} = ( \quad )_2$
- (b)** Do as directed: **04**  
 (1)  $(43)_8 = ( \quad )_{10}$   
 (2) 1's complement of  $(1101)_2$  and  $(1011)_2$
- (c)** Explain half and full adders in detail. **07**
- Q.2 (a)** What is role of complement in digital system. Compare 1's and 2's complement. **03**
- (b)** Subtract  $(1011001)_2 - (1101010)_2$  using 2's complement. **04**
- (c)** Draw & explain the block diagram of a 4:1 Multiplexer using 2:1 Multiplexer. **07**
- OR**
- (c)** With neat diagram Implement  $Y = AB + CDE + F$  using NAND gate. **07**
- Q.3 (a)**  $(1010)_2 / (101)_2 = ( \quad )_2$  **03**
- (b)** Explain in brief two bit Magnitude Comparator. **04**
- (c)** Simplify the following Boolean function using K-MAP? **07**  
 $F(A,B,C,D,E) = \sum (0,2,4,6,9,11,13,15,17,21,25,27,29,31)$
- OR**
- Q.3 (a)** Explain PLA and it's application **03**
- (b)** What do you understand by Decoder? Draw & explain 3-to-8 line Decoder. **04**
- (c)** Discuss NOR and NAND gate as universal gate. **07**
- Q.4 (a)** Explain in brief Triggering of Flip-Flops. **03**
- (b)** What is basic requirements of memory? Explain in brief EEPROM. **04**
- (c)** Write a note on edge-triggered SR and JK Flip-Flops **07**
- OR**
- Q.4 (a)** Compare Combinational logic & sequential logic? **03**
- (b)** Give classification of memory. Differentiate SRAM & DRAM **04**
- (c)** Give classification of counters and explain asynchronous 4-bit binary ripple counter. **07**
- Q.5 (a)** Define followings: **03**  
 (1) Flip-Flop (2) Fan out (2) Logic Gates
- (b)** List out the various applications of ROM memory. **04**

- (c) Discuss Following **07**  
1) Accumulator Register  
2) ALU Status Register  
3) Scratchpad memory

**OR**

- Q.5** (a) Discuss the differences between hard wired control & Micro program control. State the merits of one over the other. **03**  
(b) Explain Concept of register transfer level. **04**  
(c) Enlist the methods of control organization? Explain any one in details. **07**

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