

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 its 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 are 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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