

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER-III • EXAMINATION – WINTER • 2014

Subject Code: 130701

Date: 23-12-2014

Subject Name: Digital Logic Design

Time: 02.30 pm - 05.00 pm

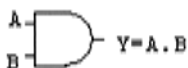
Total Marks: 70

Instructions:

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

Q.1 (a) Answer the following questions 07

1. Find out Y, if $B=1$ and $A=\text{square wave}$



2. Add the two numbers $(A3E5)_{16} + (CDA4)_{16}$

3. explain SSI, MSI, LSI and VLSI

(b) 1. Do subtraction using 12 bit two's complement method 07

$$27.125 - 79.625$$

2. Do BCD addition for given numbers

$$679.6 + 536.8$$

Q.2 (a) Reduce using K-map 07

$$\Sigma m(0, 2, 6, 10, 11, 12, 13) + d(4, 5, 14, 15)$$

(b) Obtain the set of prime implicants for $\Sigma m(0, 1, 6, 7, 8, 9, 13, 14, 15)$ 07

OR

(b) Obtain the set of prime implicants for $\Pi M(2, 3, 8, 12, 13) . d(10, 14)$ 07

Q.3 (a) Design a combinational circuit that multiplies BCD inputs by 5. Show that 07

output can be obtained from the inputs without using any logic gates.

(b) Design a combinational circuit that accepts the Decimal number in BCD and 07
display it on Seven segment display.

OR

Q.3 (a) Implement $F(A, B, C, D) = \Sigma m(0, 1, 3, 4, 8, 9, 15)$ using multiplexer, choose 07
A as input line.

(b) Design a synchronous BCD counter with JK Flip flop. 07

Q.4 (a) 1. Convert J K Flip Flop to S R Flip flop. 07

2. Show the logical diagram of clocked S R Flip flop with AND and NOR gates.

(b) Draw and explain Master- Slave Flip flop. 07

OR

Q.4 (a) Design and explain 4-bit Ripple UP/DOWN Counter using positive edge 07
triggered Flip flop.

(b) Design and implement a Modulo-6 Asynchronous counter using T Flip flop. 07

Q.5 (a) Explain the design of Arithmetic Logic Design. 07

(b) Explain the digital IC Parameters. 07

1. Fan in, Fan out

2. Propagation Delay

3. Power Dissipation

4. Noise Margin

OR

Q.5 (a) 1. Give comparison for TTL and CMOS family. 07

2. Implement basic gates using DTL logic.

(b) Explain Register Transfer Micro Operation and Arithmetic Micro Operations 07
