

CHAITANYA BHARATHI INSTITUTE OF TECHNOLOGY (Autonomous)
BE(IT) II/IV I Sem (Suppl) Examination May – Jun 2016

Digital Electronics & Logic Design

Time: 3 Hours**Max Marks:75**

Note: Answer all questions from **Section-A** at one place in the same order
 Answer any **five** questions from **Section-B**

Section - A (25 Marks)

- 1 Draw the flow-chart of design flow for logic circuits (3)
- 2 Obtain the minimal sum-of products expression for the function $f(x,y,z)=x + y' +x'y'z$ (2)
- 3 Draw the structure of CPLD (3)
- 4 Write the truth table of BCD to 7 segment display (2)
- 5 Differentiate level triggering and edge triggering (2)
- 6 Develop VHDL code for D Flip-flop (3)
- 7 Obtain the state diagram for detecting the sequence "01" (3)
- 8 Differentiate Mealy and Moore FSM (2)
- 9 Define set up time and hold time of a flip-flop (2)
- 10 What is an asynchronous sequential circuit. How the state transition takes place in these circuits. (3)

Section - B (50 Marks)

- 11 (a) Obtain the minimal POS expression for the function (5)
 $f(a,b,c,d) = \pi M(3,11,14) + D(0,2,4)$. Realize using NOR gates
- (b) Develop VHDL code for the above function (5)
- 12 (a) Implement the function $f = x \oplus y \oplus z$ using 4:1 Multiplexer (4)
- (b) Elaborate the general structure of FPGA (6)
- 13 (a) Draw the PLA implementation of the combination circuit to implement the function (5)
 $f_1(x,y,z) = \Sigma(0,3,4,6,7)$ and $f_2(x,y,z) = \Sigma(0,1,2,7)$
- (b) Develop VHDL code for a 4-bit shift register (5)
- 14 (a) Design a sequence detector to detect a serial i/p sequence 1010. It should produce (7)
 an output 1 when the input pattern has been detected
- (b) Draw and indicate the elements of ASM Chart (3)
- 15 (a) Analyze D Flip-flop as an asynchronous circuit
- (b) Construct the state table and draw the FSM model of SR latch (4)
- 16 (a) Find the complement of the function $F=x'yz' + x'y'z$ by finding the dual of the (4)
 function.
- (b) Design a 4 to 16 decoder using 3 to 8 decoders. (6)
- 17 Design a 4-bit synchronous decade counter by making use of JK flip-flops (10)