

Total No. of Questions – [08]

Total No. of Printed Pages: [02]

G.R. No.

Paper Code - U218-125(BE-ES)

**MAY 2019/ENDSEM**

**S. Y. B. TECH. (COMPUTER) (SEMESTER - I.)**

**COURSE NAME: DIGITAL SYSTEMS AND LOGIC DESIGN**

**COURSE CODE: CSUA21175**

**(PATTERN 2017)**

Time: [2 Hours]

[Max. Marks: 50]

**(\*) Instructions to candidates:**

- 1) Answer Q.1, Q.2, Q.3, Q.4, Q.5 OR Q.6, Q.7 OR Q.8
- 2) Figures to the right indicate full marks.
- 3) Use of scientific calculator is allowed
- 4) Use suitable data where ever required

Q.1) a) Simplify the four variable Boolean function using Quine McCluskey [6]  
 $f(a,b,c,d) = \sum m(0,1,2,5,6,7,8,9,10,14).$

**OR**

b) Simplify the following Boolean expression and note the Boolean or [6]  
DeMorgan's theorem used at each step. Put the answer in SOP form.

$$F_1 = \overline{(X \cdot Y)} \cdot (\overline{Y} + Z)$$

Q.2) a) Design an excess-3 code to BCD converter. Use logic gates as per your [6]  
design and requirement.

**OR**

b) Implement a 2 Bit Comparator along with truth table, k-map and logic [6]  
diagram using gates.

Q.3) a) Draw and explain 2-bit Asynchronous Counter. [6]

**OR**

b) Differentiate between synchronous and asynchronous counters [6]  
along with diagram.

Q.4) a) Write VHDL Code for a Full Adder. [4]

**OR**

b) List and explain different types of modeling style of VHDL? [4]

Q.5) a) Implement the following Boolean functions using PAL. [6]

$$A=XY+XZ' \quad A=XY+XZ'$$

$$A=XY'+YZ'$$

b) Write short notes on: PAL AND PLA? [4]

c) Implement the following Boolean expression with the help of programmable array logic (PAL) [4]

$$X=AB+AC'$$

$$Y=AB'+BC'$$

**OR**

Q.6) a) Draw the architecture for PAL and PLA. [6]

b) What are the applications of PLD's? [4]

c) Write short note on PLD'S [4]

Q.7) a) Explain Arduino architecture in detail. [6]

b) Write short note on soldering techniques? [4]

c) What is the classification of logic families? Explain any two? [4]

**OR**

Q.8) a) Explain the parameter to characterize logic families. [6]

b) What are the applications of Raspberry pi? [4]

c) Explain CMOS and RTL? [4]