Total No. of Questions – [04] Total No. of Printed Pages - [02]

G.R. No.	

U218-145 (T1)

OCTOBER 2018/ IN-SEM (T1)

S. Y. B. TECH. (INFORMATION TECHNOLOGY) (SEMESTER - I)

COURSE NAME: DIGITAL ELECTRONICS AND LOGIC DESIGN

COURSE CODE: ITUA21175

(PATTERN 2017)

Time: [**1 Hour**] [Max. Marks: **30**]

(*) Instructions to candidates:

1) **Answer Q.1 OR Q.2 and Q.3 OR Q.4.**
2) **Figures to the right indicate full marks.**
3) **Use of scientific calculator is allowed**
4) **Use suitable data wherever required**

Q.1) a) Convert the following numbers:

i. $(2598.675)_{10} = (\ )_{16}$
ii. $(110101.101010)_{2} = (\ )_{8}$
iii. $(A72E)_{16} = (\ )_{8}$ [6 marks]

b) Construct Hamming Code for the following 8-bits word. Use Even Parity.

i. 10101010
ii. 00000000
iii. 11111111 [6 marks]

c) Define Boolean algebra & Boolean Expression. Explain any 4 basic properties of Boolean algebra? [4 marks]

OR

Q.2) a) Explain in short with respect to radix, symbols used, weight assigned to position, example, and applications of the following:

i) Binary Number System ii) Hexadecimal Number System
iii) Octal Number System [6 marks]

b) Perform following arithmetic using 2's Complement:

i) $(7)_{10} - (11)_{10}$ ii) $(-7)_{10} - (11)_{10}$
iii) $(-7)_{10} + (11)_{10}$ [6 marks]

c) Minimize the 4-variable logic function using K-map technique.

$f(A,B,C,D) = ABC'D + A'BCD + A'B'C' + A'B'D' + AC' + B'$ [4 marks]

Q.3) a) Explain Adder with Look-Ahead carry. Consider 4-bit adder and formulate Boolean expressions for the carry (C_0, C_1, C_2, C_3). [6 marks]

b) Design (Truth Table, Logic Function, Circuit Diagram) Full Adder using MUX IC 74153. [4 marks]

c) Define Digital Comparators. Draw and discuss n-bit comparator. [4 marks]

OR

Q.4) a) Design (Truth Table, K-map, Boolean expressions, Circuit Diagram) and draw the 4-bit Code Converter circuit for converting Excess-3 Code to BCD Code. [6 marks]

b) Design a Full Adder circuit using logic gates. Show Truth Table, K-map simplification and Circuit diagram. [4 marks]

c) Discuss the 8-bit Parity generator/checker circuit IC 74180. [4 marks]