SYMBIOSIS INTERNATIONAL UNIVERSITY

(Established under Section 3 of the UGC Act, 1956 vide notification No. F.9-12/2001-U.3 of the Government of India)
Accredited by NAAC with 'A' grade

Name of the Institute : SIT

Programme Name : B.Tech. **Batch : 2013-17, 12-16 & 11-15**

Programme Code : 070121 **Semester : III**

Course Name : Digital Electronics and Logic Circuits (CS & IT)

Course Code : 0701211302, 0701213302

Date : 11/12/2014 **Maximum Marks : 60**

Day : Thursday **Time : 1.30 PM to 4.00 PM**

Instructions:

1. **All questions are compulsory.**
2. **Draw diagrams and state assumptions wherever necessary.**
3. **Calculators are NOT allowed.**

PART A

Q.1 **a.** Convert the given number into the bases indicated.

i) $(1010.11)_{10}$ into binary, hexadecimal. 2

ii) $(77.7)_8$ into hexadecimal. 1

b. Subtract using 2's compliment $(3)_{10} - (7)_{10}$. 3

c. Convert the following.

i) $(1101)_{gray}$ into BCD. 1

ii) $(1011)_{BCD}$ into gray code. 1

iii) $(1011)_{gray}$ into BCD. 1

d. State the difference between TTL and CMOS with respect to fan-out, power dissipation per gate, propagation delay. 3

e. Compare Combinational and Sequential Circuits. 3

PART B

Q.2 **a.** Draw and explain 2-input NAND TTL logic gate with totem pole output driver. 8

b. Simplify the following expressions using K-map: 3

$Y = \pi_{ABCD} M(0, 2, 3, 4, 6, 8, 11, 13)$

c. With the help of standard TTL logic family explain the following characteristics of digital integrated circuits. 2

i) Noise margin
ii) Propagation delay time 2

Q.3 a. Draw the circuit diagram and describe the operation performed by following circuits:

i) Full Adder 4
ii) Full Subtractor 4

b. Simplify the following expressions using Boolean laws:

i) $Y = (A+C)\,(A+D)\,(B+C)\,(B+D)$ 3
ii) $Y = (B+BC)\,(B+\bar{B}C)\,(B+D)$ 2

c. Draw logic diagram of clocked RS flip-flop and derive its characteristic equation. 2

Q.4 a. How will you convert the basic SR flip-flop into:

i) JK flip-flop 4
ii) T flip-flop 4

b. Perform the following operations in excess-3 code.

i) $(24)_{10} + (39)_{10}$ 2
ii) $(3)_{10} - (8)_{10}$ 2

c. Explain advantages and disadvantages of totem pole output. 3

OR

Q.4 a. Write Short Notes on

i) 4- Bit magnitude comparator 5
ii) Reflective property and advantages of Gray code. 5

b. Using K-map realize the following expression using minimum number of gates.

i) $Y = \sum_{PQRS} m(1,3,4,5,7,9,11,13,15)$ 2
ii) $Y = \pi_{ABCD} M(0, 4, 5, 7, 10, 11, 14, 15)$ 3