Roll No. ☐☐☐☐☐☐☐☐☐☐☐☐☐   **Total No. of Pages : 02**

Total No. of Questions : 07

B.Sc.(IT) (2015 Batch)   (Sem.–2)
DIGITAL CIRCUIT AND LOGIC DESIGN
Subject Code : BSIT-204
Paper ID : [72727]

Time : 3 Hrs.   **Max. Marks : 60**

INSTRUCTIONS TO CANDIDATES :
1. **SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.**
2. **SECTION-B contains SIX questions carrying TEN marks each and students have to attempt any FOUR questions.**

SECTION-A

1. **Write briefly :**

   i.   Write the truth table of XNOR gate.

   ii.   What are universal gates?

   iii. List two important applications of logic gates.

   iv.   Define commutative law.

   v.   What is absorption law?

   vi.   What is minterm?

   vii. Define latch.

   viii. Differentiate between a latch and a flip flop.

   ix.   What is race condition?

   x.   What is shift register?

SECTION-B

2. a. Convert $(0.6875)_{10}$ to binary. Show the steps involved.

    b. Find the octal equivalent of $(100.250)_{10}$. show the steps involved.

3. a. Prove that NAND is not associative.

    b. Simplify the following Boolean function using K-maps :

    $$F = \overline{A}\,\overline{B}\,\overline{C} + \overline{B}\,C\,\overline{D} + \overline{A}\,B\,C\,\overline{D} + A\,\overline{B}\,\overline{C}$$

4. Design the circuits for half adder and full adder and explain the steps involved.

5. Explain the design and working principles of R-S and J-K flip flops.

6. a. Explain the excitation table of a flip flop.

    b. What is a multivibrator? Explain its use in brief.

7. Convert the modulo-4 ripple counter to a synchronous counter.