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Total No. of Pages : 02

Total No. of Questions : 09

B.Tech.(CSE)/(IT) (2011 Onwards) (Sem.-3)

DIGITAL CIRCUITS & LOGIC DESIGN

Subject Code : BTCS-303

Paper ID : [A1125]

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTION TO CANDIDATES :

1. **SECTION-A is COMPULSORY** consisting of **TEN** questions carrying **TWO** marks each.
2. **SECTION-B** contains **FIVE** questions carrying **FIVE** marks each and students has to attempt any **FOUR** questions.
3. **SECTION-C** contains **THREE** questions carrying **TEN** marks each and students has to attempt any **TWO** questions.

SECTION-A

- 1. Write briefly :**

- Define the term decoder.
- Convert the following logic functions in a product of maxterms form.

$$F(A,B,C'') = (A' + B)(B' + C'')$$

- c) Represent (-11) in 2's complement form using 5 bits.
- d) How many select lines are required for 10 to 1 MUX?
- e) Why we need shift registers?
- f) Realize AND gate using only NOR gates.
- g) Which flip flop is preferred for data transfer?
- h) List various A/D converters.
- i) Give and logic diagram and characteristics table of a clocked D flip flop.
- j) What is bi-directional shift register?

SECTION-B

2. Minimize the following equations using K Map.
 - a) $Y = (A+B)(A+\bar{B})(A+\bar{C})$
 - b) $Y = \bar{A}B + A\bar{B}C + AB$
3. Convert the following numbers :
 - a) $(12.25)_{10} = (?)_2$
 - b) $(10101.1101)_2 = (?)_8$
 - c) $(125)_8 = (?)_{10}$
 - d) $(34)_{16} = (?)_2$
 - e) $(67.2)_8 = (?)_2$
4. What is race around condition? How it is avoided in Master Slave Flip Flop?
5. Explain how EPROM memory cell works.
6. Explain the working of carry look ahead adder.

SECTION-C

7. Design Mode-8 synchronous counter using T flip flops.
8.
 - a) Write a note on three state TTL.
 - b) Write down merits and-demerits if TTL over MOS gates.
9. Draw the circuit of R-2R ladder D/A converter and explain its operation. Also determine the resolution of the output from a DAC that has a 12-bit input.