B.Tech. -ECE/ 3rd Sem

Digital Circuit & Logic Design

Subject Code: BTCS-303

Batch: 2004 onwards/2011onwards/2015 onwards [Tick Relevant]

Time allowed: 3 Hrs

Max Marks:60

Important Instructions:

- Section A is compulsory
- Attempt any four questions from section B
- Attempt any two questions from section C

PART A (2×10)

Q. 1.   Answer in brief:

(a) What is race round condition and how it is removed?

(b) Define a Gate. Discuss its types.

(c)What is a register? Give its different types.

(d) Define (i) Noise Margin (ii) Fan-Out

(e) List various types of RAM and ROM.

(f) Compare sequentional and combinational circuits.

(g) List different types of counters.

(h) Convert the following binary number its octal equivalent.

$$(10110)_2 = (?)_8$$

(i)Implement half adder using NAND gates.

(j) Explain the term Resolution and Accuracy of A/D Converter.

PART B (5×4)

Q. 2.   Discuss the comparision of the important characteristics of various IC logic families.

Q. 3.   What is a decoder? Compare a decoder and a demultiplexer with a suitable diagrams.

Q. 4.   An 4-bit D/A convert has an output range of '0' to '1.5V'.Define its resolution.

Q. 5. Simplify the expression Z=AB+AC+ABC (AB+C).Implement using minimum number of NAND gates.

Q. 6. a) Realize AND, OR and NOT using NOR gates.

b) Realize X-OR function using NOR gates only.

PART C (10×2)

Q. 7. Solve the following using K-map and verify by using Boolean algebra

    (i) $F(A,B,C,D) = \sum m(3,4,5,7,9,13,14,15)$

    (ii) $F(A,B,C,D) = \sum m (0,1,2,3,6,8,9,10,11,12,13)$

    (iii) $F(A,B,C,D) = \sum m (0,1,2,3,4,5,10,11)$

Q. 8. Write Short notes on:

    a) PLA   b) PAL

Q. 9. What is a Multiplexer Tree? Why is it needed? Draw the block diagram of a 32:1 Multiplexer Tree and explain, how is input directed to output in this system.

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