

Exk III e Bous
DSD

20.5.19
APR 20 10 50 AM '19
MADRAS
UNIVERSITY
751 520
11E

Time: 3 Hours

Max. Marks: 80

- 1) Question no. 1 is compulsory.
- 2) Attempt any three out of the remaining five questions
- 3) Use suitable data, wherever necessary.

Q1: Attempt any four questions from the following. (20 M)

Compare TTL and CMOS Logic families with respect to

- i) Power dissipation ii) Propagation delay iii) Figure of merit iv) Fan-out

Convert $(73.301)_{10}$ into binary, octal, Hexadecimal and BCD equivalent.

Simplify following three-variable expression using Boolean algebra

$$\prod M(0, 1, 3, 4, 7)$$

Design Half adder circuit using basic gate.

Explain different types of triggering methods used for flipflop

2 A) Perform following operation: (10 M)
i) Addition $24_{BCD} + 18_{BCD}$ ii) Subtraction $46_{10} - 22_{10}$ using 2's complement method

2 B) Reduce the given expression and Realize using NAND gate only. (10 M)
 $Y = AB' + AC' + C + AD + AB'C + ABC$

3 A) Simplify the following function using Quine-Mccluskey method. (10 M)
 $\sum m(1, 2, 3, 5, 9, 12, 14, 15) + \sum d(4, 8, 11)$

3 B) Design 2 Bit Magnitude comparator using gates (10 M)

(A) Implement the following Boolean function with 8:1 Multiplexer (10 M)
 $F(A, B, C, D) = \sum m(0, 2, 6, 10, 11, 12, 13) + \sum d(3, 8, 14)$

(B) Draw and explain working of Bidirectional shift register. (10 M)

(A) Design MOD 13 Asynchronous up counter using JK Flip flop (10 M)

(B) Convert JK Flip flop into D and SR flipflop (10 M)

(A) Design 3 bit Synchronous counter using T flip flop (10 M)

(B) Explain Race around condition in JK flipflop and discuss solution to avoid Race around condition (10 M)