Exam.Code:0976
Sub. Code: 7363

1059

M. Tech. (Micro-Electronics)
Second Semester
MIC-6201: Digital Integrated Circuits and Systems

Time allowed: 3 Hours   Max. Marks: 50

NOTE: *Attempt five questions in all, including Question No. I which is compulsory and selecting two questions from each Unit.*

x-x-x

I.   Attempt the following:-

   a)   Differentiate between a flip-flop and a latch.

   b)   Under what circumstances are algorithmic state machines used?

   c)   What is the difference between combinational and sequential circuits? Explain.

   d)   What is the advantage of ROM's over RAM's?

   e)   Why should be wired AND be avoided?   (5x2)

UNIT – I

II.   a) Define Noise and discuss in detail about the noise considerations in logic families.

   b)   Three CMOS devices are connected in cascade. If each has a propagation delay time of 100ns, what is the total propagation delay time?   (7,3)

III.   a) Design a 3-bit synchronous up-counter.

   b)   What is an ASM? Explain its basic elements using suitable diagrams.   (5,5)

IV.   a) Design a sequence detector for detection of the sequence "110" for a Mealy machine using D flip-flops.

   b)   Draw and explain the block diagrams of Mealy and Moore sequential machines. How are they different from each other?   (5,5)

UNIT – II

V.   a)   Write a VHDL code to design a full-adder using half-adders.   (5)

   b)   How does a read and write operation takes place in memory? Elaborate.

P.T.O.

(2)

VI.   a)   Implement the following using a PLA:

$F_1 (A, B, C) = \Sigma (0, 2, 5, 7)$ and $F_2 (A, B, C) = \Sigma (2, 3, 4, 5)$

b)   Draw and explain the operation of a FIFO circuit, using suitable diagrams. (5,5)

VII.   a)   Discuss in detail the channel communication protocols and standards.

b)   Write a short note on Barrel shifter.   (5,5)

x-x-x