

2063
M. Tech. (Microelectronics)
Second Semester
MIC-209: Digital Integrated Circuits Design

Time allowed: 3 Hours

Max. Marks: 50

NOTE: Attempt five questions in all, including Question No. 1 (Section-A) which is compulsory and selecting two questions each from Section B-C.

x-x-x

SECTION-A

1. a) What is PLA? How it does differ from ROM?
b) Define propagation delay.
c) Why is the fan-out of CMOS gates frequency dependent?
d) What is the difference between power consumption and power delay product?
e) What are the disadvantages of ECL gates? (5*2=10)

SECTION-B

- 2) Explain and design high speed adders. Where these adders are used and why? (10)
- 3) a). Why MUX is called a Universal Circuit? Explain. (5)
b). Design 4:1 MUX using 2:1 MUX. (5)
- 4) What are asynchronous inputs? Explain and sketch a single simple synchronizer using logic and timing diagrams. (10)

SECTION-C

- 5) What are two types of basic state machines? Explain the steps involved in designing a FSM. (10)
- 6) Design a barrel shifter using 16 data inputs, 16 data outputs and 4 control inputs. (10)
- 7) a) What are the three types of sequential circuits? (5)
b) Design a data unit and a control unit state machine for dividing 8 bit unsigned number using the shift and subtract algorithm. (5)

x-x-x