V-SEM./ETE/ECE/ 2021(W)

TH-II VLSI and Embedded System

Full Marks: 80 Time- 3 Hrs

Answer any five Questions including Q No.1& 2
Figures in the right-hand margin indicates marks

1. Answer **All** questions 2 x 10

a. Write the advantages of VLSI technology.
b. Differentiate between enhancement and depletion type nMOS transistor
c. Draw the stick diagram of CMOS inverter.
d. Define noise margins **(NM_L and NM_H)** of an CMOS inverter.
e. Define delay time of an CMOS inverter
f. Name the VHDL design units.
g. What is EDA in VLSI? Give an example of EDA tool.
h. What are the basic components of an embedded system?
i. Write any two differences between Arduino and Raspberry Pi.
j. Draw the XOR gate using pass transistor.

2. Answer **Any Six** Questions 5X6

a. Write the difference between full custom and semicustom design in VLSI
b. Explain the capacitances of an nMOS transistor.
c. Realize NAND2 gate using CMOS inverter.
d. Explain the working of resistive load inverter
e. What is FPGA? Explain its architecture with proper diagram.
f. Implement clocked SR latch using CMOS NOR2 gates.
g Differentiate between SRAM and DRAM.

3 Describe VLSI design methodology, design flow and Y chart. 10

4 Differentiate between positive and negative photoresist. Draw the steps for VLSI fabrication of a CMOS inverter in n-Well process. 10

5 Draw and explain the voltage transfer characteristics (VTC) of a CMOS inverter. 10

6 Derive the current equation of an enhancement type nMOS transistor. 10

7 Explain the working of digital camera with the help of block diagram 10