

## VLSI & EMBEDDED SYSTEM

### **(A) Short Questions. (2 Marks)**

1. Define Moore's Law ?
2. What is parasitic capacitance ?
3. Name the types of VLSI design styles ?
4. What are four generations of ICs ?
5. State the difference between enhancement and depletion mode transistor ?
6. Write down two difference between semi custom and full custom design ?
7. When the channel is said to be pinched off ?
8. Define turn around time ?
9. What is pull down and pull up devices ?
10. Why NMOS technology is preferred more than PMOS technology ?
11. What are the different operating regions for an MOS transistor ?
12. What is Lithography ?
13. Define the photoresist and classify it ?
14. Write down the two uses of poly silicon in a MOS transistor ?
15. Which color coding is used for n- diffusion and poly silicon in a stick diagram ?
16. Define delay time ?
17. Define regularity and modularity ?
18. What are the 3 domains of Y- chart ?

19. Define Layout design rules ?
20. Define Noise Margin ?
21. Draw the stick diagram of CMOS Inverter ?
22. Write down the difference between DRAM and SRAM ?
23. Write down the applications of DRAM and SRAM ?
24. What is embedded system in a computer system ?
25. Mention what are the essential components of embedded system ?
26. What are real time embedded system ?
27. Mention the difference between Microprocessor and Microcontroller ?
28. What is a watchdog timer ?
29. Define enter path ?
30. State the advantages of CMOS inverter over other inverters ?

**(B) 5 Mark Questions.**

1. Explain the oxide related capacitance with neat diagram ?
2. Derive the drain current using channel length modulation method ?
3. Draw the Y chart and explain steps of each domain ?
4. Define the regularity, modularity and locality and explain the design hierarchy ?
5. Explain the basic steps of fabrication ?
6. With neat diagram explain the fabrication process of NMOS transistor ?
7. Explain the working of resistive load inverter and derive the  $V_{OL}, V_{OH}, V_{IL}, V_{IH}$  ?

8. Explain the working of CMOS two input NAND gate ?
9. With neat diagram explain the working of SR latch circuit with its truth table ?
10. Explain the working of clocked SR latch ?
11. Explain the working of CMOS D latch ?
12. With neat diagram explain with working of SRAM ?
13. What is flash memory ? Explain the working of flash memory ?
14. Write a short note on VHDL ?
15. Write a short note on FPGA ?
16. Explain the basic concept of Arduino microcontroller ?
17. Explain the VHDL for design synthesis using CPLD or FPGA ?
18. Explain the Characteristics of embedded system ?
19. Describe the basic architecture of single purpose processors ?
20. Explain the IC technology in embedded system ?
21. Explain the difference between full custom and semi custom ?
22. Write down a short note on CMOS transmission gate ?

**(C) 10 Marks Questions .**

1. With neat diagram describe the different types of MOSFET Capacitances ?
2. Describe the structure and operation of N-MOS enhancement type ?
3. Derive the drain current equation using channel length modulation ?
4. Describe the different types of VLSI design styles ?

5. With neat diagram describe the CMOS fabrication process by N- well on P- substrate ?
6. Describe the circuit operation of CMOS inverter with its VTC Curve ?
7. Describe the operation of SRAM with proper diagram ?
8. Describe the working of digital camera with neat diagram ?