**A** **Reg. No. :** | | | | | | | | | | |

# Question Paper Code: 59501

B.E. / B.Tech. DEGREE EXAMINATION, NOV 2018

Elective

Electronics and Instrumentation Engineering

15UEI901– VLSI SYSTEM DESIGN

(Regulation 2015)

Duration: Three hours Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

1. Which technology has photo-electronic properties?. CO1- R

   (a) GaAs (b) BiCMOs (c) CMOS (d) nMOS

2. The photoresist layer is exposed to CO1- R

   (a) Visible Light (b) Infra Red Light (c) Ultraviolet Light (d) LED

3. In the design rules the implant layer has CO2- R

   (a) 2λ x 2λ (b) 4λ x 4λ (c) 6λ x 6λ (d) 8λ x 8λ

4. The transistors used in BiCMOS are: CO2- R

   (a) BJT (b) MOSFET (c) Both BJT and MOSFETs (d) JFET

5. Identify the circuit constructed with pair of inverters ganged together to perform function CO3- R

   (a) Symmetric (b) Non symmetric (c) SFPL (d) CVPL

6. Multipliers are built using CO3- R

   (a) Binary Adders (b)Binary Subtractors (c) Dividers (d) Multiplexers

7. PLA contains CO4- R

   (a) AND and OR arrays (b) NAND and OR arrays

   (c) NOT and AND arrays (d) NOR and OR arrays

8. Which type of device FPGA are? CO4- R

(a) SLD (b) SROM (c) EPROM (d) PLD

9. The members function of VHDL modules declared between CO5- R

(a) BEGIN – END (b) { - }

(c) { - } (d) ( - )

10. Which clause is used to declare the packages? CO5- R

(a) Use (b) Entity (c) Architecture (d) Components

PART – B (5 x 2= 10Marks)

11. What is the difference between enhancement and depletion mode MOS device CO1- U

12. What is transmission gate? CO2- R

13. What is bubble pushing? CO3- R

14. What are pre diffused array? CO4 -R

15. Write the difference between Exit and Wait statement. CO5- U

PART – C (5 x 16= 80Marks)

16. (a) Discuss in detail about the modes of operation of MOS transistor with necessary equations. CO1- U (16)

Or

(b) Explain the different steps involved in the fabrication of NMOS with a neat diagram. CO1- U (16)

17. (a) Discuss the mathematical equation that can be used to mode the drain current diffusion capacitance of MOS transistors**..** CO2- App (16)

Or

(b) Discuss the principles of constant field and lateral scaling. .Write the effects of the above scaling methods on the device characteristics. CO2- Ana (16)

18. (a) Explain the domino and dual rail domino logic families with neat diagram. CO3- U (16)

Or

(b) (i) Explain the domino and dual rail domino families with neat diagrams. CO3- Ana (8)

(ii) Describe the different methods of reducing static and dynamic power dissipation in CMOS circuits CO3- Ana (8)

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| 19. | (a) | What is semi custom design ASIC? Explain standard cell based design in detail. | CO4- U | (16) |
| | | Or | | |
| | (b) | Explain about building block architecture of FPGA. | CO4- U | (16) |
| 20. | (a) | Write the VHDL program to design the multiplexer and de multiplexer circuits. | CO5- U | (16) |
| | | Or | | |
| | (b) | (i) Construct a VHDL code for JK Flip flop. | CO5- App | (8) |
| | | (ii) Develop a VHDL program for 4:1 MUX | CO5- App | (8) |