Reg. No. : | | | | | | | | | | |

Question Paper Code: 46404

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

Sixth Semester

Electronics and Communication Engineering

14UEC604-VLSI DESIGN

(Regulation 2014)

Duration: Three hours Maximum: 100 Marks

Answer ALL Questions

(Smith chart may be permitted)

PART A - (10 x 1 = 10 Marks)

1. CMOS IC packages are available in

   (a) DIP configuration (b) SOIC configuration
   (c) DIP and SOIC configurations (d) Neither DIP nor SOIC configuration

2. The difficulty in achieving high doping concentration leads to

   (a) Error in concentration (b) Error in variation
   (c) Error in doping (d) Distribution

3. In accordance to the scaling technology , the total delay of the logic circuit depends on

   (a) The capacitor to be charged
   (b) The voltage through which capacitance must be charged
   (c) Available current
   (d) All of the above

4. In CMOS circuits, which type of power dissipation occurs due to switching of transient current & discharging of load capacitance?

(a) Static dissipation (b) Dynamic dissipation

(c) Both a and b (d) None of the above

5. The output of latches will remain in set/reset until

(a) The trigger pulse is given to change the state

(b) Any pulse given to go into previous state

(c) They don't get any pulse more

(d) None of the Mentioned

6. The sequential circuit is also called

(a) Flip-flop (b) Latch (c) Strobe (d) None of the Mentioned

7. Boundary scan test is used to test

(a) Pins (b) Multipliers (c) Boards (d) wires

8. CMOS domino logic occupies

(a) Smaller area (b) Larger area

(c) Both of the mentioned (d) None of the mentioned

9. Test Benches procedure is _____

(a) Smaller design (b) Larger design

(c) Complicated (d) None of the mentioned

10. Among the VHDL features, which language statements are executed at the same time in parallel flow?

(a) Concurrent (b) Sequential (c) Net-list (d) Test-bench

PART - B (5 x 2 = 10 Marks)

11. Define threshold voltage in CMOS.

12. Define design margin.

13. Draw the pseudo nmos inverter.

14. What is stuck – at fault?

15. What is the structural gate-level modeling?

PART - C (5 x 16 = 80 Marks)

16. (a) Draw and explain the DC transfer characteristics of a CMOS inverter with necessary conditions for the different regions of operation. (16)

Or

(b) (i) Explain the DC transfer characteristics of CMOS inverter with necessary conditions for the different regions. (8)

(ii) Obtain the threshold voltage equation for different threshold voltage effects. (8)

17.(a) Explain in detail about delay estimation, logical effort and transistor sizing with example. (16)

Or

(b) Explain the static and dynamic power dissipation in CMOS circuits with necessary diagrams and expressions. (16)

18. (a) Describe the basic principles of operation of pseudo Nmos, Dynamic Cmos, domino and NP domino logic with neat diagrams. (16)

Or

(b) Explain in detail about sequencing dynamic circuits and synchronizers. (16)

19. (a) Explain system level test techniques/boundary scan test. (16)

Or

(b) Explain in detail about silicon debug principles. (16)

20. (a) Explain the concept involved in structural gate level modeling and also give the description for Decoder and parity encoder. (16)

Or

(b) Explain the looping statements and procedural assignments in VERILOG HDL. (16)