

**B. TECH. SEM -VI (E & TC ENGG.) (2014 COURSE) (CBCS) :**

**SUMMER - 2018**

**SUBJECT: VLSI DESIGN**

Day : **Wednesday**

**S-2018-2459**

Time **02.30 PM TO 05.30 PM**

Date : **06/06/2018**

Max. Marks: 60

**N.B.**

- 1) All questions are **COMPULSORY**.
- 2) Figures to the right indicate **FULL** marks.
- 3) Use of non-programmable calculator is allowed.
- 4) Assume suitable data if necessary.

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- Q.1**
- a) What is the importance of design hierarchy? Explain w.r.t. VLSI design. (04)
  - b) Draw stick diagram of NAND. (06)
- OR**
- a) Discuss concepts of regularity, modularity and locality. (04)
  - b) Draw stick diagram of NOR. (06)
- Q.2**
- a) Describe capacitance associated with inverters. (04)
  - b) Explain operation of MOS transistor in saturation region. (06)
- OR**
- a) Define  $\tau_{PHL}$ ,  $\tau_{PLH}$ ,  $\tau_{rise}$  and  $\tau_{fall}$ . (04)
  - b) What is full scaling? Explain impact of full scaling on MOS parameters. (06)
- Q.3**
- a) Write VHDL code for 1 x 8 demultiplexer. (06)
  - b) Write note on package, signal and variable used in VHDL. (04)
- OR**
- a) Compare different styles of modeling in VHDL. (04)
  - b) Write VHDL code for 4 bit parallel adder using full adder as a component. (06)
- Q.4**
- a) Draw the general structure of FPGA and explain. (05)
  - b) Write VHDL code for T-flipflop in behavioral model. (05)
- OR**
- a) Differentiate between FPGA and CPLD. (04)
  - b) Write VHDL code for 4 bit down counter. (06)
- Q.5**
- Give overview of power consumption. (10)
- OR**
- Explain Adiabatic circuits. (10)
- Q.6**
- a) What are the fault types? Explain in brief. (04)
  - b) Discuss Adhoc Testable design technique. (06)
- OR**
- a) What is the importance of testing? Describe in brief. (04)
  - b) Explain BIST. (06)

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