

B.Tech. VIII Semester (Main/Back) Examination - 2013
Electronics & Comm.
8EC4.2 VHDL (Common with 8EX4.2)

Time : 3 Hours

Maximum Marks : 80
 Min. Passing Marks : 24

Instructions to Candidates:

Attempt any five questions, selecting one question from each unit. All questions carry equal marks. (Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.)

Unit - I

1. a) Draw and explain the basic design flow for logic circuits. (10)
 b) Write and compare the design entry methods for logic circuits. (6)

OR

1. a) Compare the features of VHDL and Verilog. (6)
 b) With the help of flow chart show the full representation of CAD tools for VHDL. (10)

Unit - II

2. a) Implement the function $f(w_1, w_2, w_3, w_4) = \bar{w}_1 \bar{w}_2 \bar{w}_4 \bar{w}_5 + w_1 w_2 + w_1 w_3 + w_1 w_4 + w_3 w_4 w_5$ by using a 4 to 1 multiplexer and as few other gates. (10)
 b) Write the VHDL code for BCD - to - 7 segment decoder. (6)

OR

2. a) Write the VHDL code for a 16-to-1 Multiplexer using a generate statement. (8)
 b) Using a conditional signal assignment write VHDL code for an 8-to-3 binary encoder. (8)

Unit - III

3. a) Design a four bit up counter that has a reset input, Reset n, and enable input E write its VHDL code. (8)
 b) A universal shift register can shift in both the left to right and right to left directions. Write the VHDL code for universal shift register with n bits. (8)

OR

3. a) Write VHDL code that represents a JK flip flop. (6)
b) Write VHDL code for modulo-6 up counter with synchronous reset. (6)
c) Compare level triggered and edge triggered systems. (4)

Unit - IV

4. a) A coin operated vending machine dispenses Candy under the following conditions.
- The machine accepts nickels and dimes.
 - It takes 15 cents for a piece of Candy to be released from the machine.
 - If 20 cents is deposited, the machine will not return the change, but it will credit the buyer with 5 cents and wait for the buyer to make a second purchase.
- Draw the state diagram for vending machine and use state minimization technique. rtuonline.com (14)
- b) Give the difference between Moore and Melay machines. (2)

OR

4. a) A sequential circuit has two input, w_1 and w_2 and an output z . Its function is to compare the input sequence on the two inputs. If $w_1 = w_2$ during any four consecutive clock cycles the circuit produces $z = 1$, otherwise $z = 0$. For example
- w_1 : 0110111000110
 w_2 : 1110101000111
 z : 0000100001110
- Derive a suitable ckt. (8)
- b) Write the VHDL code for derived circuit. (8)

Unit - V

5. a) Draw the schematic diagram for the data path circuit for the divide operation. (8)
b) Briefly explain the clock synchronization. (8)
- OR**
5. a) Explain the ASM chart for the Multiplier also sketch the datapath circuit for it. (10)
b) Draw the schematic diagram of a SRAM block. (6)

