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16192(D) - 0 DEC 2016

B. Tech 7th Semester Examination

Digital System Design Using HDL (NS)

EC-412

Time : 3 Hours **Max. Marks : 100**

The candidates shall limit their answers precisely within the answer-book (40 pages) issued to them and no supplementary/continuation sheet will be issued.

Note : (i) Attempt five questions in all selecting one question each from sections A, B, C & D. Section-E is compulsory.
(ii) All parts of a question should be answered at one place.
(iii) Answers should be brief and to-the-point supplemented with neat sketches.

SECTION - A

1. (a) Define the different behavioral and structural models. Write the code for a half subtractor using behavioral models. (10)

   (b) Explain the different types of operators and data types. (10)

2. (a) What are assignment statements and two dimensional arrays? Enlist a process to read from the array, (10)

   (b) Define functions and explain the significance of function applications. (10)

SECTION - B

3. (a) Design a MOD-10 counter using T flip-flop with its coding processes. (10)

   (b) Design a 4- bit shift register and enlist the test bench for verification. (10)

4. (a) What are multiplexers? Design a 16:1 multiplexer tree using 8:1 data selectors. (10)

   (b) What is the significance of BCD code? Design a 4-bit decimal to BCD code converter circuit. (10)

SECTION - C

5. (a) Describe the significance of DMA. Implement a DMA and control register. (10)

   (b) Implement a microprocessor register block for checking the configuration as well as the status. (10)

6. (a) Define DRAM. Describe the different structures of DRAM. (10)

   (b) Explain the significance of skewed clock with its merits and demerits. (10)

SECTION - D

7. (a) Describe the PAL and its applications. Design a function $f=\Sigma(0,3,4,5,6)$ using PAL. (10)

   (b) Explain the FIR filter design using the flow charts. (10)

8. (a) Explain the different classes of verifications with suitable examples. (10)

   (b) What are the ASIC design procedures? Explain the design partition process. (10)

SECTION - E

9. (a) Enlist the delays and their significance in digital design.
   (b) Elaborate the process of code customization using generics.
   (c) What is universal shift register?
   (d) Enlist the applications of flip-flops.
   (e) What is carry ripple adder circuit?
   (f) Describe the register block synthesis process.
   (g) What is the difference between gated clock and skew clock?
   (h) Define FIFO.

(2½×8=20)