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	Reg. No. :
	Question Paper Code: 30287
	M.E./M.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2022
	First Semester
	Applied Electronics
	AP 4152 – ADVANCED DIGITAL SYSTEM DESIGN
	(Common to : M.E. VLSI Design)
	(Regulations 2021)
Ti	me: Three hours  Maximum: 100 marks
**	Answer ALL questions.
	PART A — $(10 \times 2 = 20 \text{ marks})$
2. 3.	List the Practical Application for the State Table and state diagram.  Differentiale Sequential Circuit from Combinational Circuit.  What are the two types of asynchronous sequential circuits?
4.	What is races in asynchronous circuits?
5.	Realize the following Boolean expression using a suitable PLA $Y = A + BC$ .
6.	Specify the features of the Boundary-scan over other BISTs.
7.	List any two advantages of Programmable Logic Devices.
8.	What is SRAM technology used in Xilinx FPGAs?
9.	
10	). What are the different Data types in VHDL?
	PART B — $(5 \times 13 = 65 \text{ marks})$
1	<ol> <li>(a) Explain how the behaviour of a clocked synchronous sequential network is described by a state table. With an example explain the state table reduction technique.</li> </ol>
	Or
	(b) Design a Parallel unsigned binary multiplier using an ASM chart.

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 (a) Discuss in detail the analysis and design of asynchronous sequential circuit with suitable examples.

Or

- (b) Sketch and explain the mixed operating mode of asynchronous circuits.
- (a) Discuss in detail the various testability algorithm employed in digital system design.

Or

- (b) (i) State and explain the D algorithm.
  - Explain with an example how path sensitization can be done in a Boolean circuit.
- 14. (a) Draw the internal structure of a Xilinx FPGA and explain.

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- (b) Design an up-down decade counter using a PAL.
- 15. (a) Explain in Detail the Types of operators in Verilog HDL.



PART C —  $(1 \times 15 = 15 \text{ marks})$ 

16. (a) The vending machine delivers an item after it has received 15 cents in coins. The machine has a single coin slot that accepts nickels and dimes, one coin at a time. A mechanical sensor indicates whether a dime or a nickel has been inserted into the coin slot. The controller's output causes a single item to be released down a chute to customer.

Or

(b) Design a simple microprocessor and write the Verilog code to realize it.

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