



12. (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.

13. (a) Discuss in detail the various testability algorithm employed in digital system design.

Or

- (b) (i) State and explain the D algorithm.  
(ii) 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.

Or

- (b) Design an up-down decade counter using a PAL.

15. (a) Explain in Detail the Types of operators in Verilog HDL.

Or

- (b) Write a 4X1 Mux Verilog program using the Structural and Behavioral model.

PART C — (1 × 15 = 15 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.