

2023
M. Tech. (Micro-Electronics)
First Semester
✓ MIC-109: Hardware Description Languages

Time allowed: 3 Hours

Max. Marks: 50

NOTE: Attempt five questions in all, including Question No. 1 which is compulsory and selecting two questions from each Unit.

x-x-x

- I. Attempt the following:-
- Briefly discuss top-down methodology using suitable example.
 - List advantages of HDLs over sequential programming languages.
 - Discuss precedence of operators in VHDL.
 - Write VHDL code for half-adder.
 - Why Verilog is preferred over VHDL nowadays? (5x2)

UNIT - I

- II. a) Discuss significant features of VHDL.
b) Design 4x1 Multiplexer using 2x1 Multiplexer and write VHDL code. (2x5)
- III. a) Write VHDL code for D flip-flop with negative edge triggered clock. Write test bench to verify its functionality.
b) What are different types of architectures available in VHDL? Give Suitable examples. (2x5)
- IV. a) Discuss importance of process statement in VHDL.
b) Design and write code of 3x8 decoder using when else statement. (4,6)

UNIT - II

- V. a) Design and write Verilog HDL code for 4-bit down-counter.
b) List key difference between VHDL and Verilog HDL. (2x5)
- VI. a) Describe Predefined attributes in VHDL using an example.
b) Design full adder using structural modelling style. (2x5)

P.T.O.

(2)

VII. Write short note on the following:-

- a) Sequential Wait Statement
- b) Advanced Arithmetic Operators
- c) Modules (in Verilog)
- d) Configurations

(4x2½)

x-x-x