

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -2 EXAMINATIONS-2022

M.Tech-II Semester (ECE)

COURSE CODE (CREDITS): 21M11EC211 (3)

MAX. MARKS: 25

COURSE NAME: Digital System Design using Verilog HDL

COURSE INSTRUCTORS: Pardeep Garg

MAX. TIME: 1 Hour 30 Min

Note: All questions are compulsory. Marks are indicated against each question in square brackets.

Q1 (i). A multiplexer with 8 inputs, corresponding select lines, and 1 output has to be designed. Draw the logic diagram of the circuit for this situation. Write the complete Verilog design code using gate-level modeling corresponding to your logic diagram. [1.5+3.5=5 marks]

Q1 (ii). Write the stimulus/test bench code for checking the functionality of Verilog design code in part (i) and show the output for few cases. [3 marks]

Q2. Two signals A and B are given as input to an OR gate. Input A is high for initial 20 units of time and then low upto 80 units of time; input B is alternately high and low for 10 units of time each (total time duration is 80 units). Draw the output waveform (corresponding to output variable as out) for the condition given in the following Verilog statement:

assign #5 out= A & B; [2 marks]

Q3. In the current era when logic gate densities on chips are increasing rapidly, which modeling technique is more appropriate? Justify your answer with proper logic. [2 marks]

Q4. Assuming 2 operands C and D, distinguish between logical operators and bitwise operators with the help of suitable examples. [2 marks]

Q5. "The result of case equality operators never comes to be an x value". Justify this statement with the help of suitable examples. [2 marks]

Q6. Write the Verilog design code only using data flow modeling in which conditional operator should be used taking any suitable example. [3 marks]

Q7. Compute the result of the following operations:

i) $\wedge A$ for the value of $A = 5'b11001$ ii) $Z = B \ll 2$ for value of $B = 4'b0011$

iii) $C = A ** B$ for $A = 4, B = 3$ iv) $Y = !X$ for $X = 5$

v) $-d20/10$ vi) $Y = \{ 3\{L\}, 4\{M\}, 3'b110 \}$ for $L = 2'b10, M = 1'b1$

[1*6=6 marks]