

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -2 EXAMINATIONS-2022

B.Tech-VII Semester (ECE)

COURSE CODE (CREDITS): 18B1WEC744(3)

MAX. MARKS: 25

COURSE NAME: FPGA BASED INSTRUMENTATION SYSTEM DESIGN

COURSE INSTRUCTORS: Dr. Shruti Jain

MAX. TIME: 1 Hour and 30 Minutes

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

Q1. 1 × 5 = 5 [CO3, CO4]

- Draw the waveforms of a 3 flip flop ripple counter. What type of counter it forms?
- If the number of x selected input lines is equal to 2^y then it requires _____ select lines.
- How many adders/ subtractor are used to design a circuit that performs the operation: $15 + 10$. Which combinational circuit is used to design
- Gitika wants to design R-2R ladder digital to analog converter. Help her in designing the circuit .
- The content of a 4 bit register is initially 1001. Show how this data is shifted to right.

Q2. For the state diagram given in Figure 1, design the sequential circuit using D flip flop. [5] [CO3]

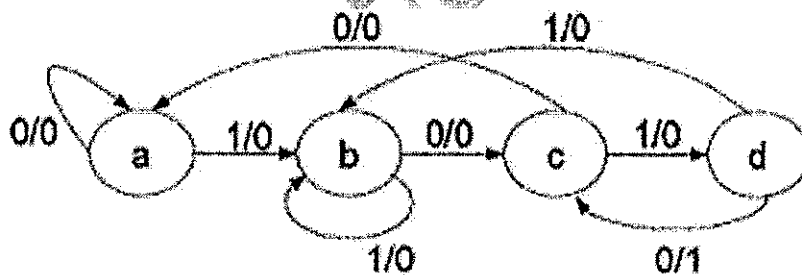


Figure 1

Q3. Satish just learned how a three-bit synchronous binary counter works, and he is excited about building his own. He does so, and the circuit works perfectly. Draw the circuit which Satish has designed assuming T flip flop. [5] [CO4]

Q4 Geeta wants to design a circuit that results in the output as 1 when all inputs are equal to 1, and an even number of inputs are equal to 1. Determine the equation and design the circuit with three inputs (x, y, z) and one output (f). [5] [CO3]

Q5. Design a sequence detector to detect a sequence 0110 for the sequence 0110011001100110 using sequential programmable logic devices. [5] [CO4]