

Course Code: EE-1005	Course Name: Digital Logic Design
Instructor Name: Sumaiyah Zahid	
Student Roll No:	Section:

**Instructions:**

- In case of any plague you will be given straight 0.

**Total Marks: 100**

**Circuit Designing**

**Marks: 100**

- Design a logic diagram to convert JK Flip Flop to D Flip Flop. Also design a T Flip Flop using JK Flip Flop.
- Implement SISO, PISO, PIPO, SIPO using JK Flip Flop.
- Design a basic counting circuit that produces a binary sequence from zero through seven by using negative edge-triggered J-K flip-flops.
- In the shipping department of a softball factory, the balls roll down a conveyor and through a chute single file into boxes for shipment. Each ball passing through the chute activates a switch circuit that produces an electrical pulse. The capacity of each box is 32 balls. Design a logic circuit to indicate when a box is full so that an empty box can be moved into position.
- Implement a sequence detector using D flip flop which detect a pattern of non-overlapping 1111. Draw the state diagram as well

X: 0011101100111100111111111100...

Y: 00000000000000100000100010000...

Hint ([https://www.youtube.com/watch?v=HXG\\_YPVNI5M](https://www.youtube.com/watch?v=HXG_YPVNI5M))

- Draw the logic diagram for a modulus-18 Johnson counter using SR flip flop. Show the timing diagram and write the sequence in tabular form.
- Draw the logic diagram for a modulus-12 Johnson counter using D flip flop. Show the timing diagram and write the sequence in tabular form.
- Make a security system of door lock in which you enter a code from keypad. If it's match with the predefined security code (i.e 2493) then the door should open otherwise not. Use shift register, decimal to BCD converter, magnitude comparator and other helpful blocks to implement the logic diagram of the system.
- Design a serial 2's complemeter with shift register and a flip-flop. The binary number is shifted out from one side and it's 2's complement shifted into the other side of the shift register.
- Draw a circuit diagram of the serial adder for 16-bit addition showing the connections for all the components. Use only 1 full adder module, each bit would move serially in and output will come serially out.

