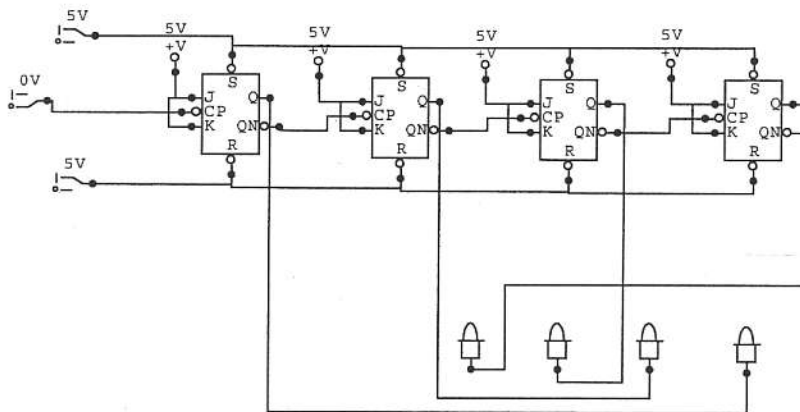
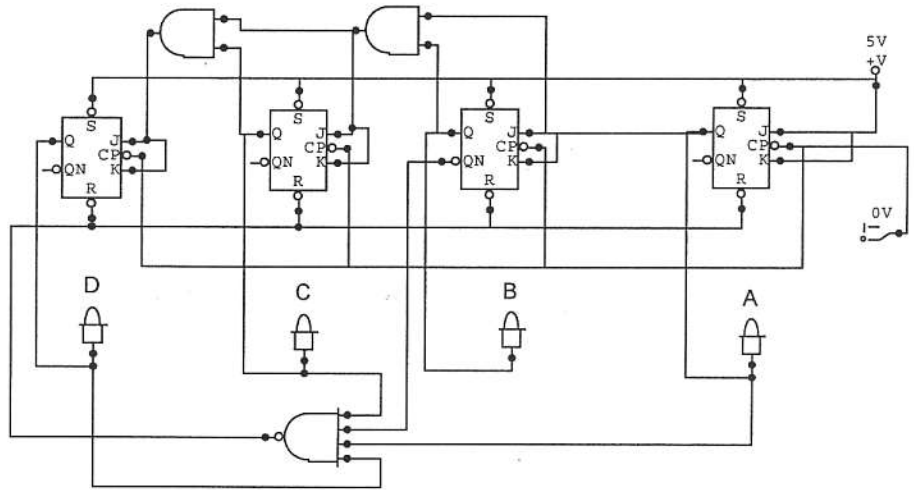
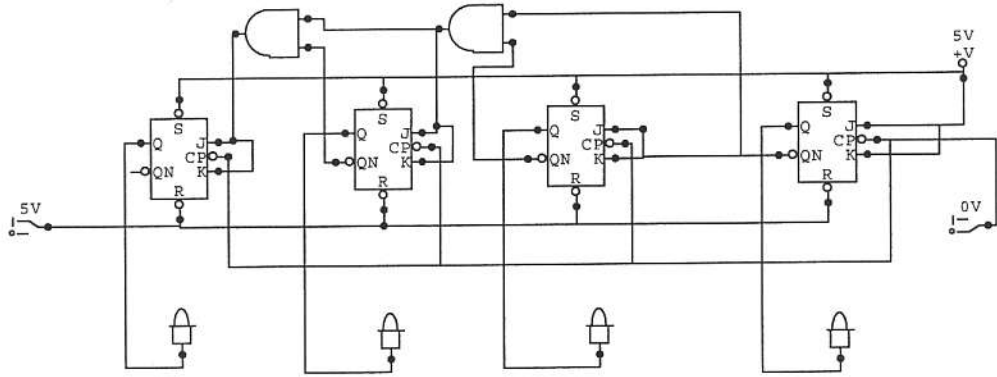
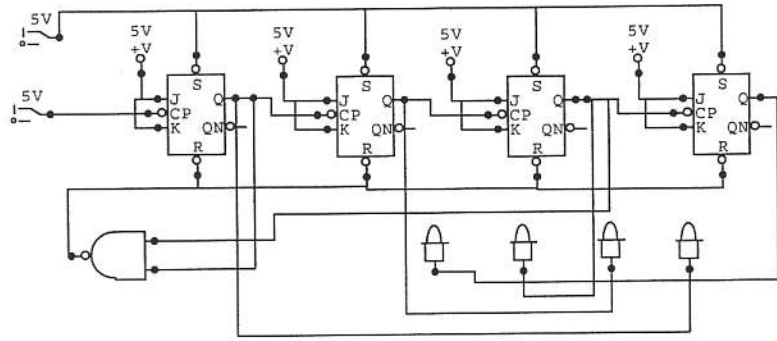


Counter Review

For each counter below, complete the listed items.

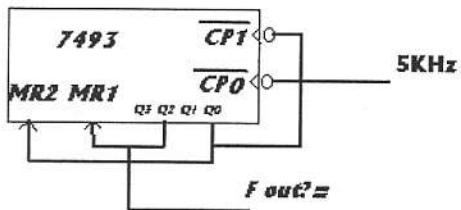
1. *STATE SYNCHRONOUS OR ASYNCHRONOUS*
2. State the counting sequence
3. State the mod#
4. Circle the LSB Flip Flop





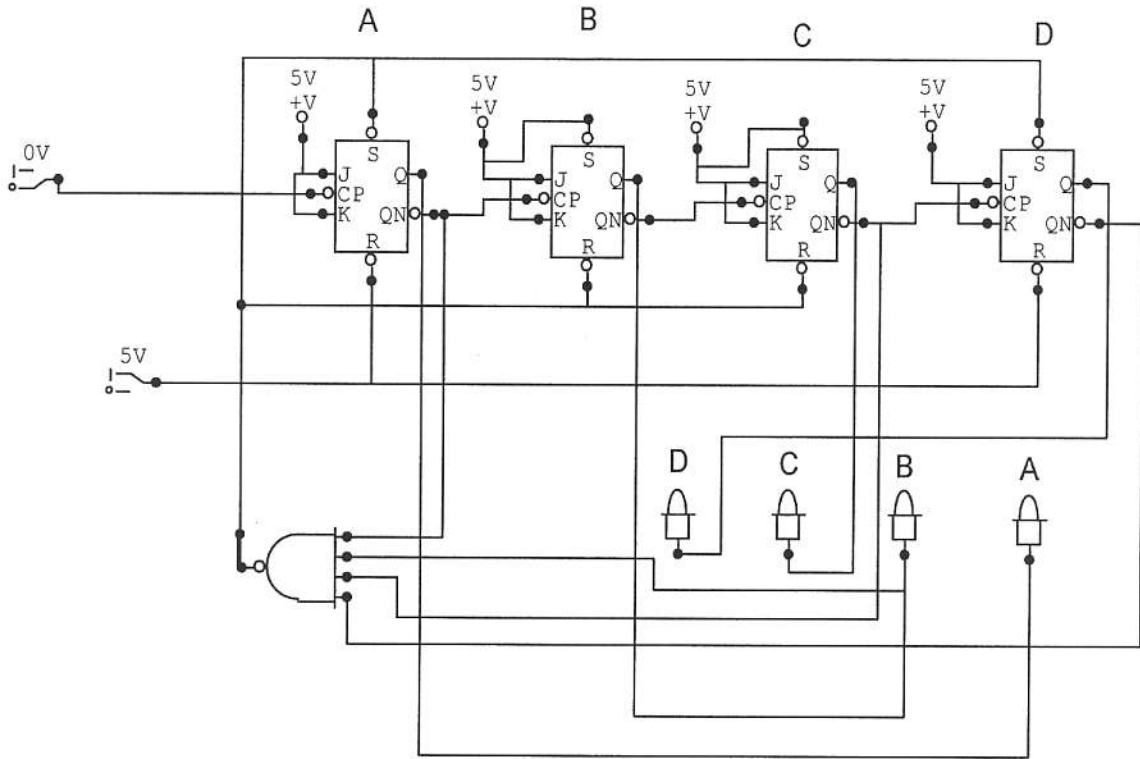
18. Design a counter with a modulus of 23 starting from 0, include all Flip Flop inputs.

19. Given the counter below, what is the output frequency?

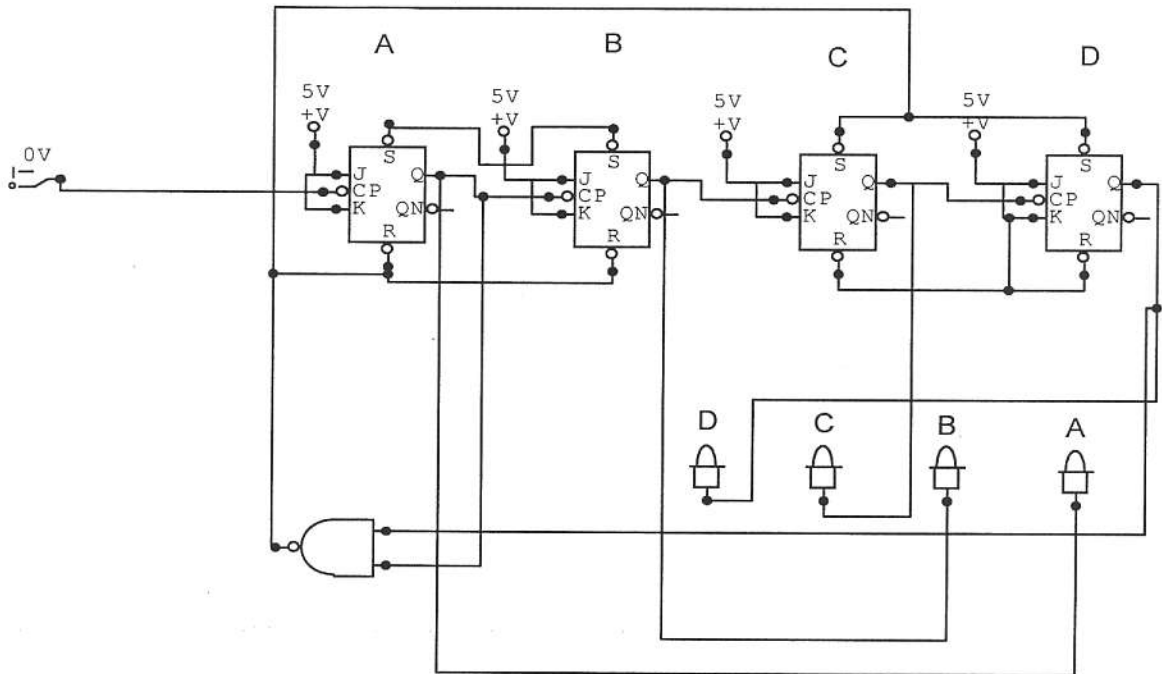


Counter Decoding Practice

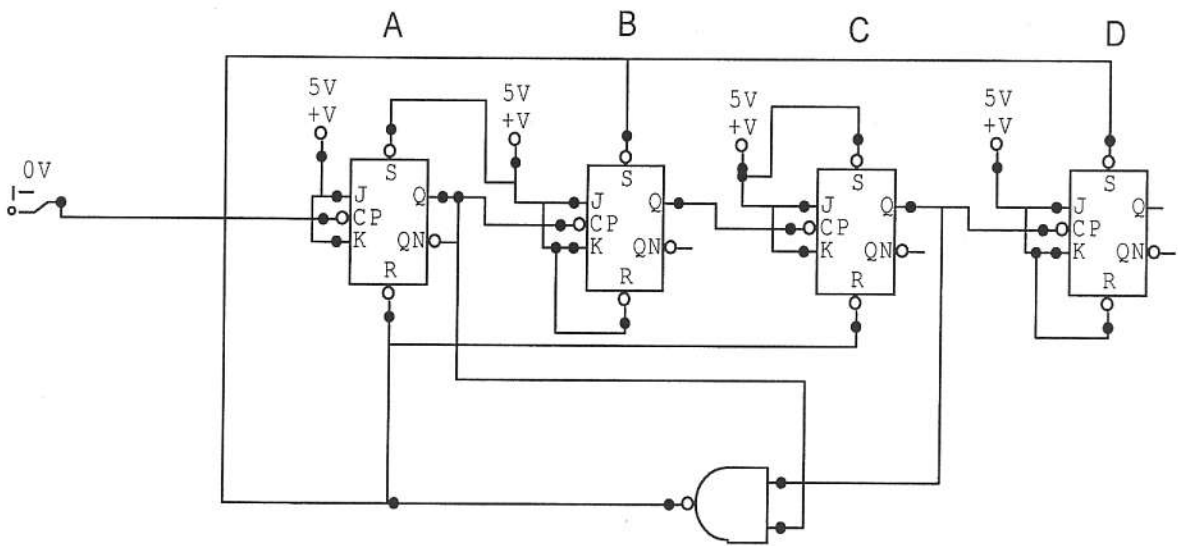
For each of the counters below, state the MOD# and list the counting sequence in decimal. Use the pre-loaded number and # of clock cycles to determine the counters end state in decimal.



Preloaded with a 3, after 4 clock cycles =	Preloaded with a 5, after 9 clock cycles =
Preloaded with a 6, after 22 clock cycles =	Preloaded with a 4, after 11 clock cycles =
Preloaded with a 7, after 6 clock cycles =	Preloaded with a 8, after 10 clock cycles =

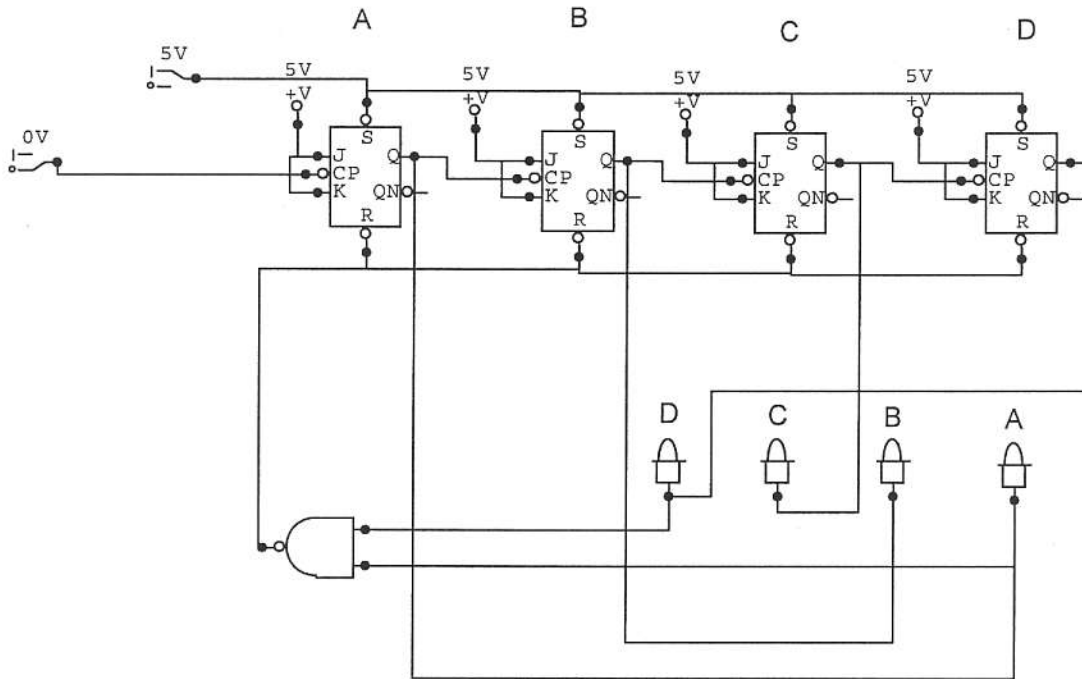


Preloaded with a 3, after 4 clock cycles =	Preloaded with a 5, after 9 clock cycles =
Preloaded with a 0, after 12 clock cycles =	Preloaded with a 4, after 11 clock cycles =
Preloaded with a 7, after 6 clock cycles =	Preloaded with a 8, after 5 clock cycle =

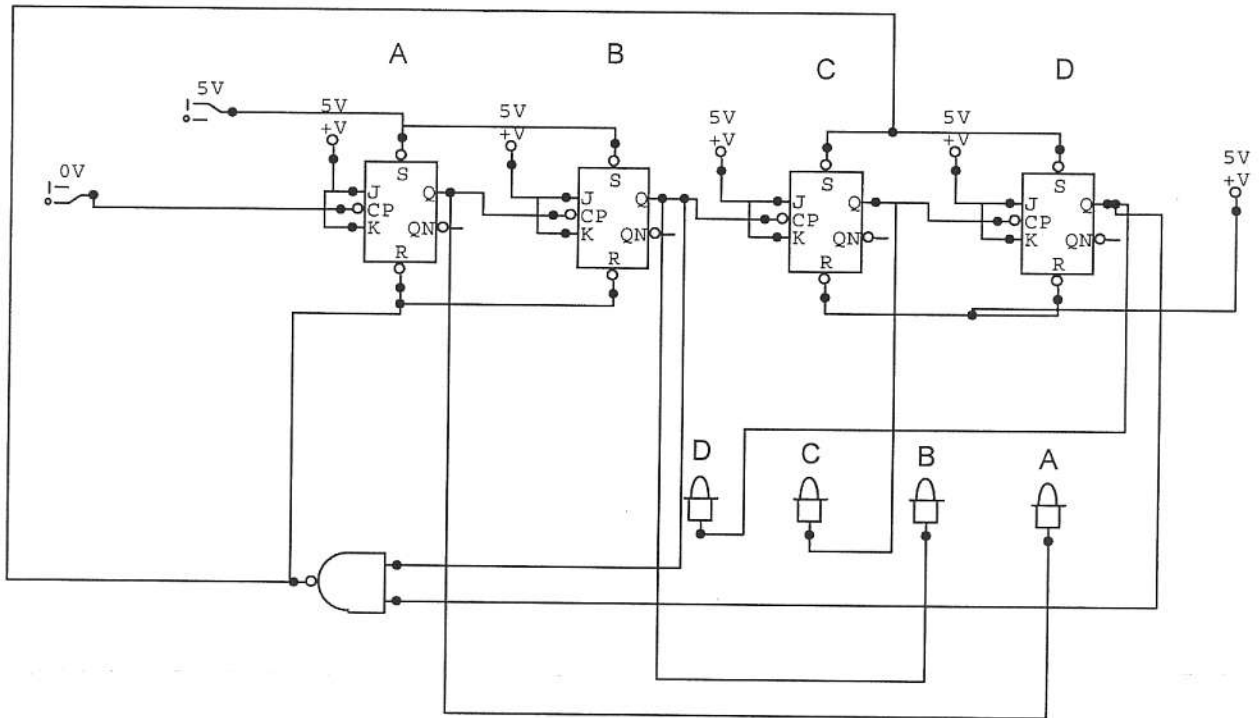


Counter Decoding Practice

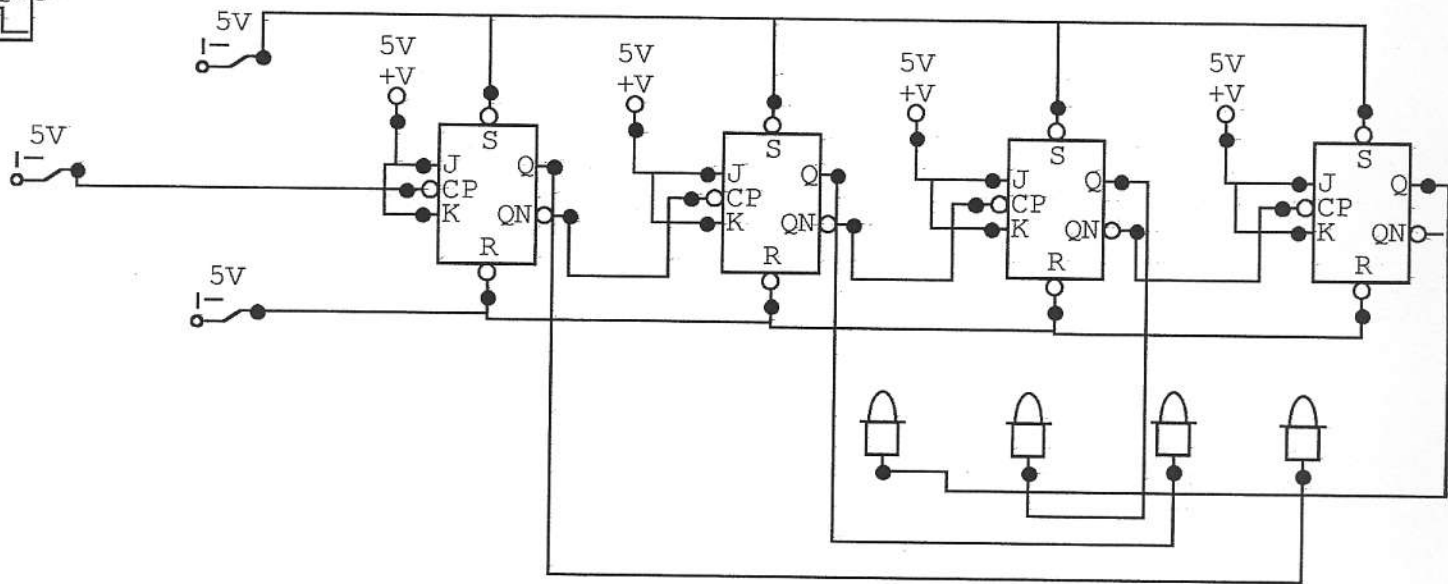
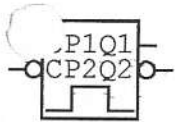
For each of the counters below, state the MOD# and list the counting sequence in decimal. Use the preloaded number and # of clock cycles to determine the counters end state in decimal.



- | | |
|---|---|
| Preloaded with a 3, after 4 clock cycles = | Preloaded with a 5, after 9 clock cycles = |
| Preloaded with a 0, after 22 clock cycles = | Preloaded with a 4, after 11 clock cycles = |
| Preloaded with a 7, after 6 clock cycles = | Preloaded with a 8, after 1 clock cycle = |

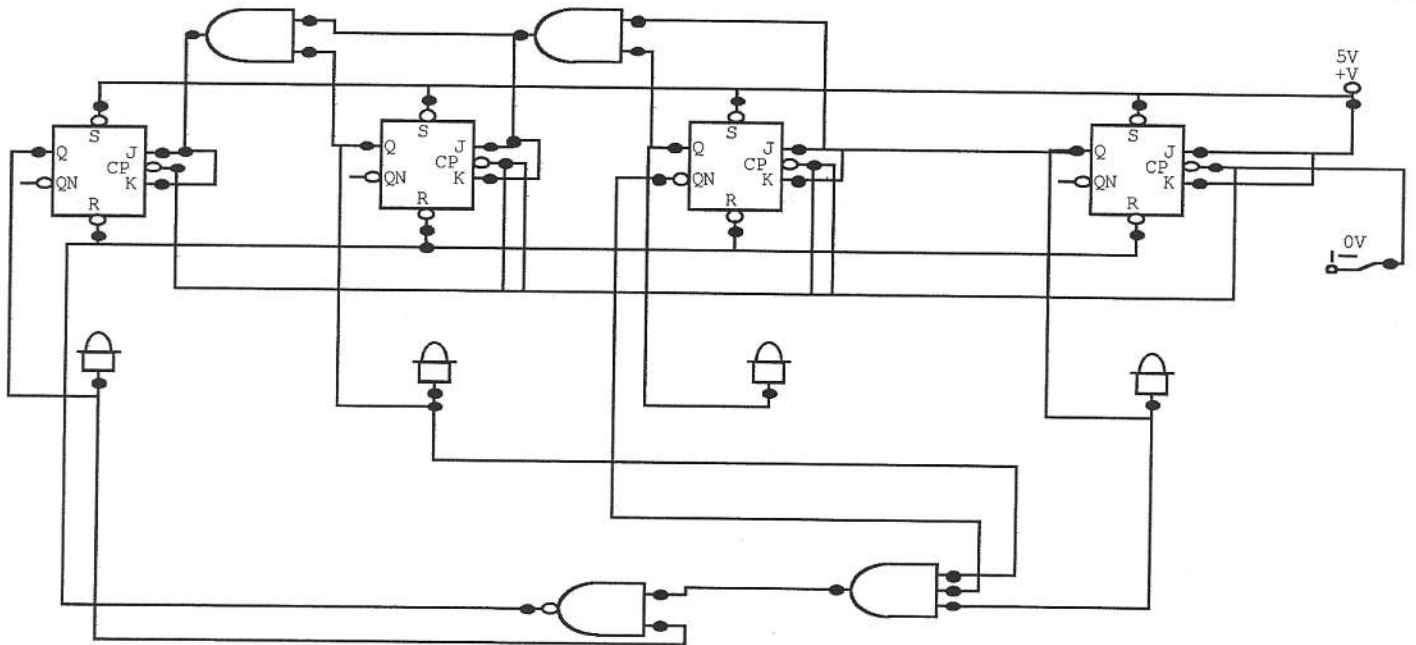


Preloaded with a 3, after 4 clock cycles =	Preloaded with a 5, after 9 clock cycles =
Preloaded with a 0, after 22 clock cycles =	Preloaded with a 4, after 11 clock cycles =
Preloaded with a 7, after 6 clock cycles =	Preloaded with a 8, after 1 clock cycle =



Using the counter above, state what number would be displayed in decimal if it was given x amount of clock cycles with y # loaded in it.

1. Loaded with a 6, after 6 clocks =
2. Loaded with a 3, after 12 clocks =
3. Loaded with a 0, after 16 clocks =
4. Loaded with a 9, after 4 clocks =



Using the counter above, state what number would be displayed in decimal if it was given x amount of clock cycles with y # loaded in it.

1. Loaded with a 6, after 6 clocks =
2. Loaded with a 3, after 12 clocks =
3. Loaded with a 0, after 16 clocks =
4. Loaded with a 9, after 4 clocks =

Mod Counter Design Practice

Draw the appropriate number of flip flops and NAND gates to make an **Asynchronous mod17 up counter** that will start counting from 0. Include all synchronous and asynchronous inputs on each flip flop. NAND gate inputs may be labeled with the appropriate Q or Qnot outputs (be sure to label your flip flops), and inputs that do not change may be indicated with a 1, 0, +v, +5, low, etc next to them.

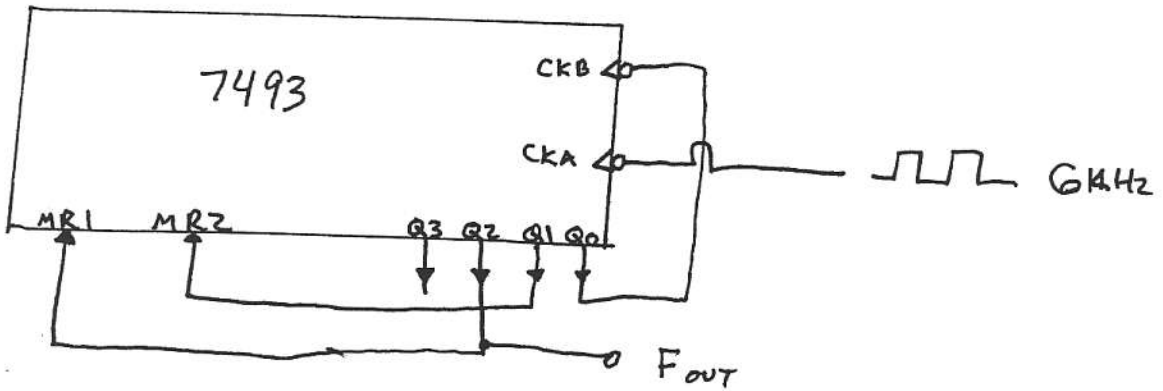
Mod Counter Design Practice

Draw the appropriate number of flip flops and NAND gates to make an **Asynchronous mod26 up counter** that will start counting from 0. Include all synchronous and asynchronous inputs on each flip flop. NAND gate inputs may be labeled with the appropriate Q or Qnot outputs (be sure to label your flip flops), and inputs that do not change may be indicated with a 1, 0, +v, +5, low, etc next to them.

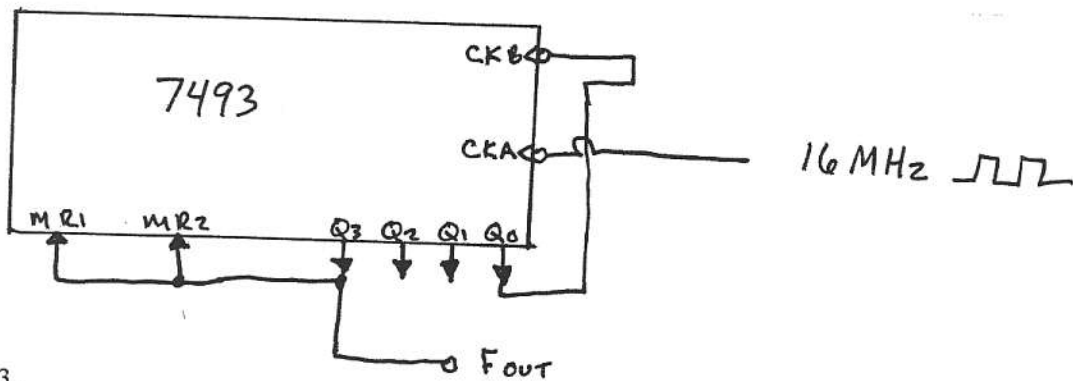
IC Counter Decoding and Frequency Division

For each IC counter below, state the counting sequence and the output frequency.

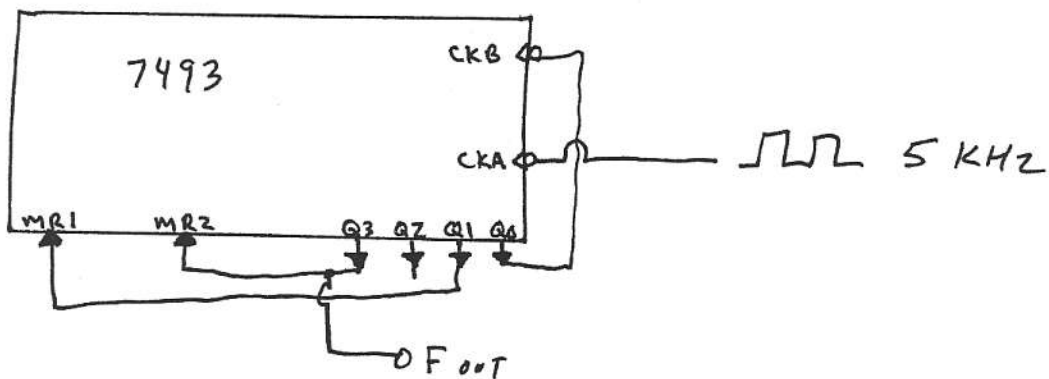
1.



2.

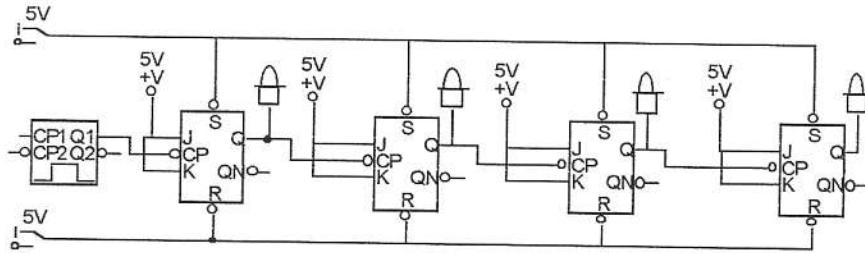


3.



32. Given the schematic diagram of a counter circuit and the value currently on the counter, the student will determine the new value on the counter if an instructor specified number of pulses is applied to the counter with 100% accuracy.

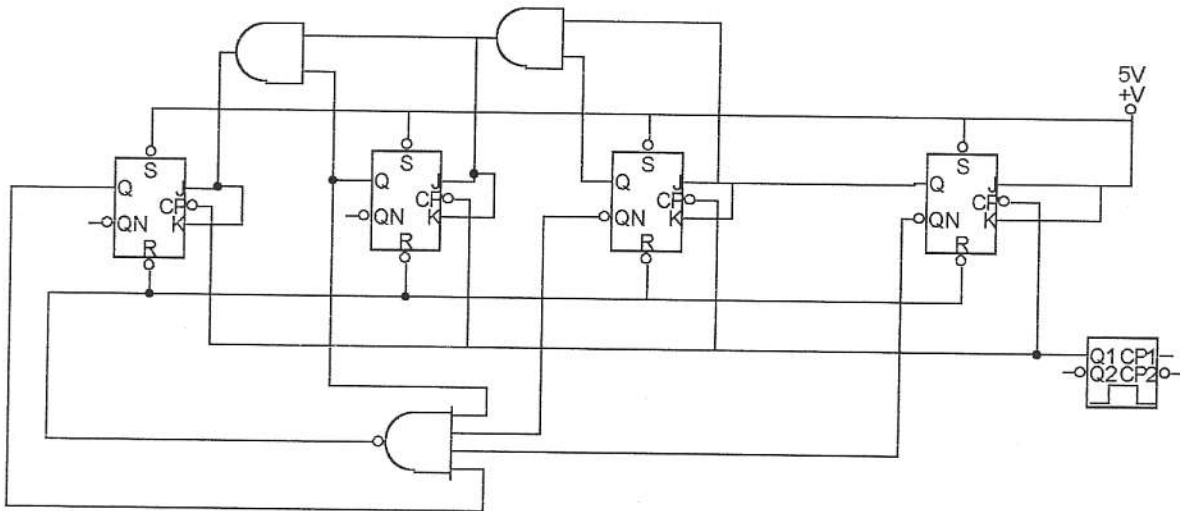
Present count is 1001. What is the count after 9 pulses?



33. Given a modulus number from 16 to 32, the student will draw using the appropriate number of flip-flops and NAND gates the counter circuit will count this modulus starting from zero with 100% accuracy.

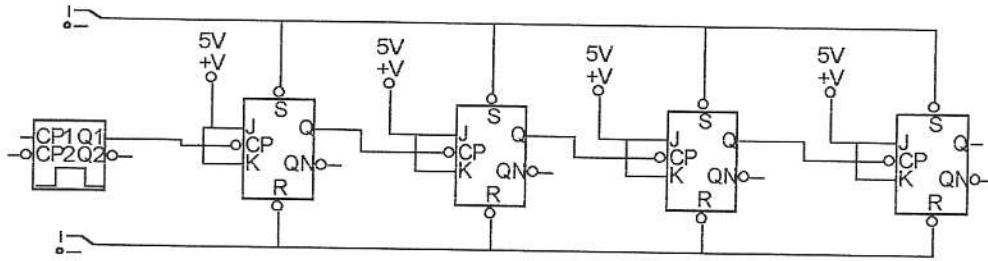
MOD-24

34. Given the schematic diagram of a synchronous counter circuit the student will determine the modulus of the circuit with 100% accuracy.

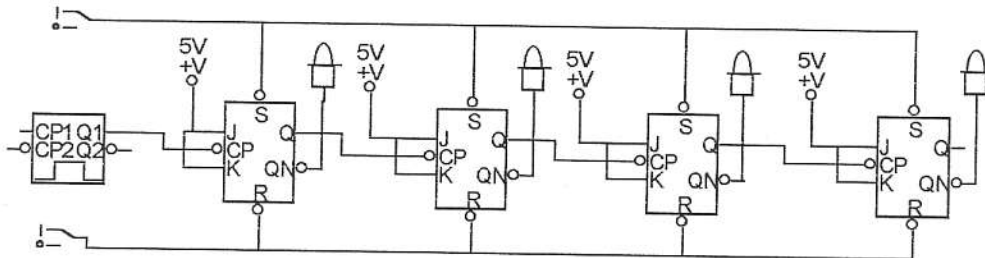


Third Term Theory Competencies Digital Electronics

29. Given the schematic diagram of a counter circuit, the student will determine if this counter is synchronous or asynchronous with 100% accuracy.



30. Given a schematic of an asynchronous counter, the student will identify the LSB flip-flop with 100% accuracy.



31. Given a schematic of a synchronous counter, the student will identify the LSB flip-flop with 100% accuracy.

