

Name: \_\_\_\_\_

1. Convert the following numbers to binary, octal hexadecimal and BCD, show work, don't just plug in your calculator.

a) 95

b) 171

c) 255

Hex table

0	0000
1	0001
2	0010
3	0011
4	0100
5	0101
6	0110
7	0111
8	1000
9	1001
A	1010
B	1011
C	1100
D	1101
E	1110
F	1111

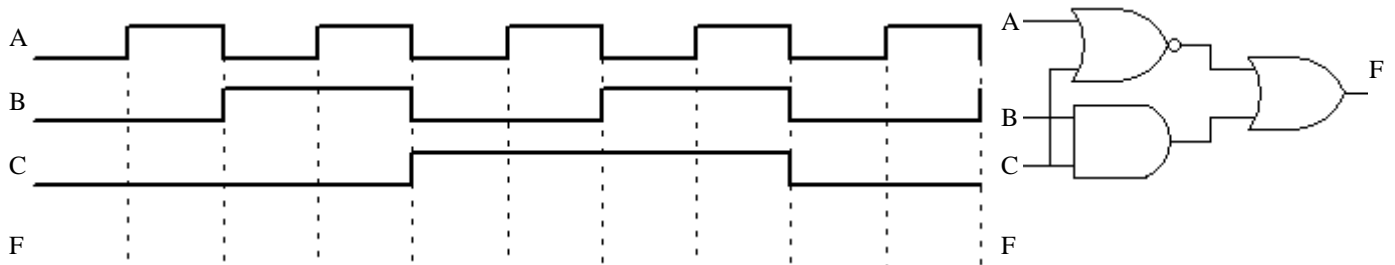
2. Add the following numbers then convert the results to decimal.

a) 0010  
0111

b) 1101010  
1011011

c) hex 2B13  
02F4

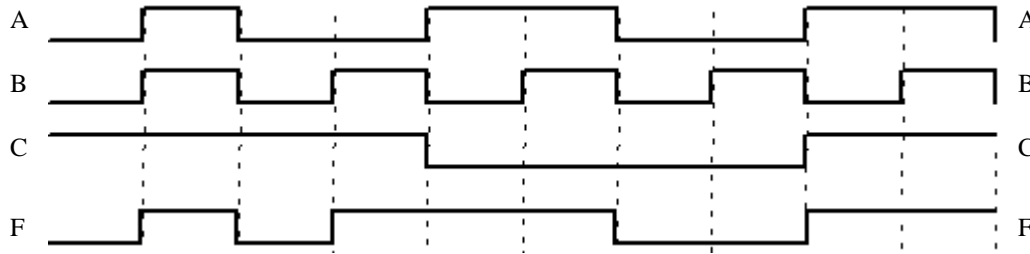
3. The timing diagram below shows three inputs to the circuit shown. Find and draw the output F.



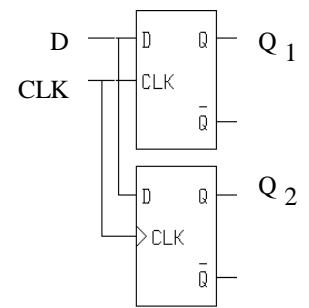
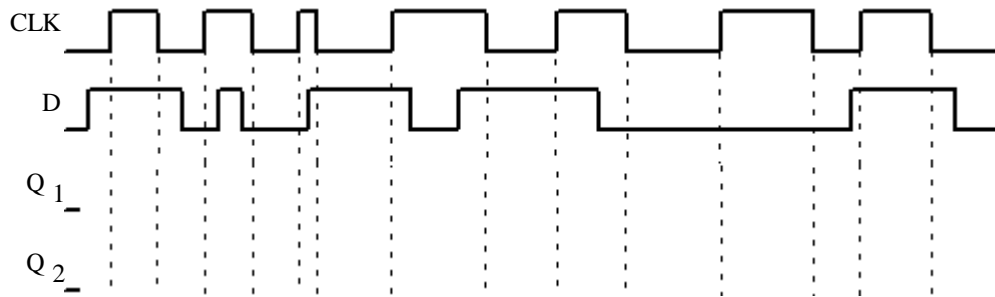
**Answers**

1. a) 01011111    137<sub>o</sub>    5F<sub>h</sub>    1001 0101                      2. a) 1001    9                      b) 11000101    197  
 b) 10101011    253<sub>o</sub>    AB<sub>h</sub>    0001 0111 0001                      c) 2E07<sub>h</sub> = 11783  
 c) 11111111    377<sub>o</sub>    FF<sub>h</sub>    0010 0101 0101                      3. F is high for A intervals: 1, 3, 7-9, otherwise low

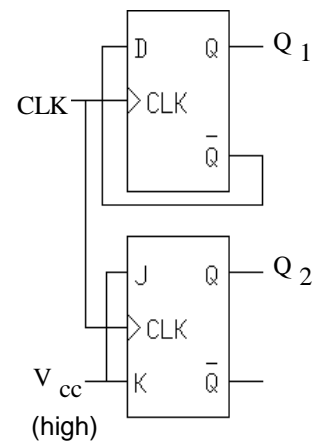
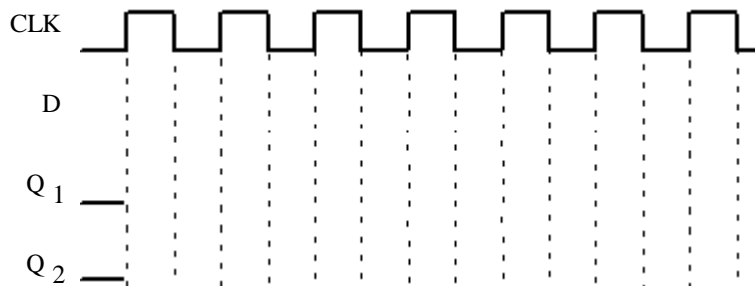
4. The timing diagram below shows three inputs and a desired output. Construct a circuit or choose a device which will produce the desired output. Draw the circuit or device and label the inputs and output.



5. The same D and CLK (shown below) are applied to two D flip-flops. The first is level-triggered like that shown in Figure 12.78 (p687) in your textbook. The second is positive edge-triggered. Find and draw the two outputs,  $Q_1$  and  $Q_2$ .



6. The same CLK (shown below) is connected to two flip-flops. Find and draw the two outputs,  $Q_1$  and  $Q_2$ .



**Answers** 4.  $F = A + B \cdot C$

