2-1] $t_p = \frac{1}{f}$

a) $t_p = \frac{1}{2MHz} = \frac{1}{2\times10^6}\,sec = \boxed{500ns}$

b) $t_p = \frac{1}{500kHz} = \frac{1}{500\times10^3}\,sec = \boxed{2\mu s}$

c) $t_p = \frac{1}{4.27MHz} = \frac{1}{4.27\times10^6}\,sec = 2.34\times10^{-7}s = \boxed{234ns}$

d) $t_p = \frac{1}{17MHz} = \frac{1}{17\times10^6}\,sec = 5.88\times10^{-8}s = \boxed{58.8ns}$

$f = \frac{1}{t_p}$

e) $f = \frac{1}{2\times10^{-6}} = 500000Hz = \boxed{500kHz}$

f) $f = \frac{1}{100\mu sec} = \frac{1}{100\times10^{-6}} = 10000Hz = \boxed{10kHz}$

g) $f = \frac{1}{0.75ms} = \frac{1}{0.75\times10^{-3}} = 1333Hz = \boxed{1.33kHz}$

h) $f = \frac{1}{1.5\mu s} = \frac{1}{1.5\times10^{-6}} = 666666.7Hz = \boxed{667kHz}$

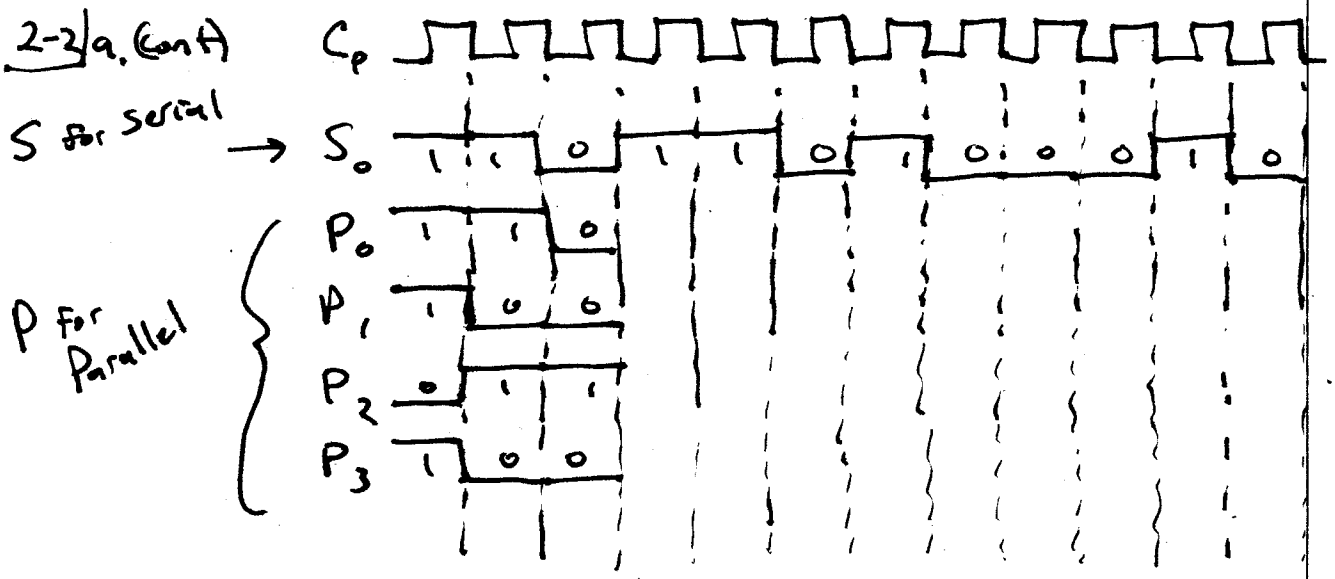
(9min)

2-2] a) 1st Convert to Binary

$45B_{16} = 0100\ 0101\ 1011$

2nd Draw Serial Representation and Parallel Representation (Next Page) with clock.

2-3/a. (Cont.)



3rd) Determine period

$$t_p = \frac{1}{2\times10^6} = 500\,ns$$

4th) Calculate t_{serial} and $t_{parallel}$ $\left(\frac{bits}{cycle}\right)^{-1}$ "

$$t = (\#\ symbols) \times \left(\frac{bits}{symbol}\right) \times (Period) \times \left(\frac{cycle}{bits}\right)$$

$$t_{serial} = \frac{3\ symbols}{} \left| \frac{46\ bits}{symbol} \right| \frac{500\,ns}{cycle} \left| \frac{1\ cycle}{1\ bit} \right.$$

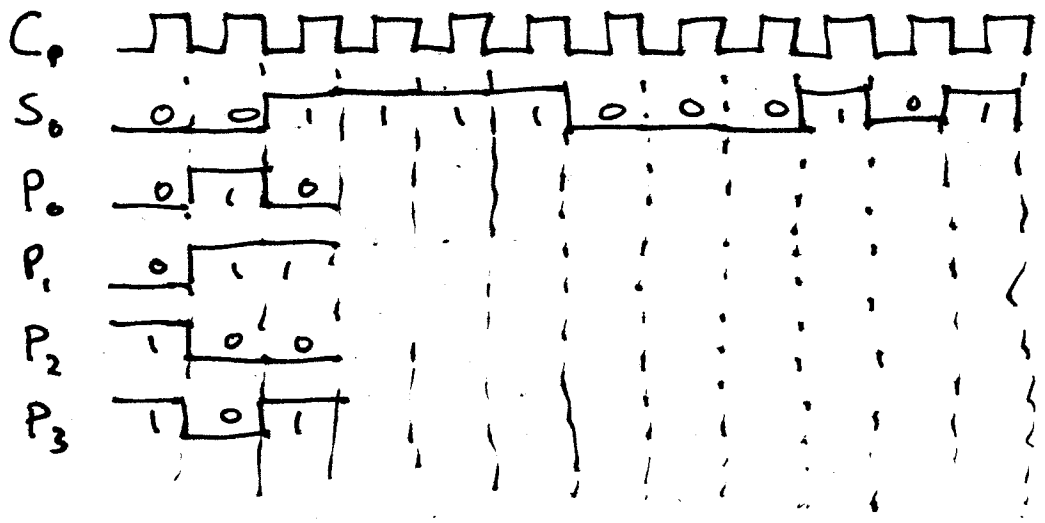
$$= \boxed{6\,ms}$$

$$t_{parallel} = 3\,symbols \left| \frac{46\ bits}{symbol} \right| \frac{500\,ns}{cycle} \left| \frac{cycle}{46\ bits} \right.$$

$$= \boxed{1.5\,ms}$$

(15 min)

2-2 b. $A3C_{16} = 1010\ 0011\ 1100_2$



t_{SERIAL} } are the same as for part a.
$t_{PARALLEL}$ } since same # of symbols, clock rate and bits per symbol.

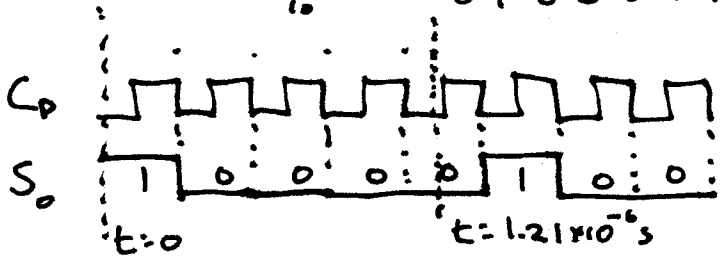
(4 min)

2-3 a. $t_{SERIAL} = \left(\#\text{symbols}\right) \times \left(\frac{\text{bits}}{\text{symbol}}\right) \times \left(\frac{\text{time}}{\text{cycle}}\right) \times \left(\frac{\text{cycles}}{\text{bits}}\right)$

$$t_{SERIAL} = 1 \times \frac{8\text{bits}}{\text{symbol}} \times \frac{\text{sec}}{3.7\times10^6\ \text{cycle}} \times \frac{\text{cycle}}{1\text{bit}}$$

$$= \boxed{2.16\,\mu s}$$

b. $33_{10} = 00100001_2$ (bit 7 6 5 4 3 2 1 0)



$$t_p = \frac{1}{f} = \frac{1}{3.7\times10^6} = 2.70\times10^{-7}\,s$$

$$\frac{1.21\times10^{-6}\,s}{2.7\times10^{-7}\,s} = 4.44$$

Low (6 min)

2-4 a. $t_{parallel} = (\#\text{symbols}) \times \left(\frac{\text{bits}}{\text{symbol}}\right) \times \left(\frac{\text{time}}{\text{cycle}}\right) \times \left(\frac{\text{bits}}{\text{cycle}}\right)^{-1}$

$\left(\frac{\text{cycle}}{\text{bits}}\right)$

$t_{parallel} = 3 \times \frac{8 \text{ bits}}{\text{symbol}} \times \frac{\text{sec}}{8 \times 10^6 \text{ cycles}} \times \left(\frac{8 \text{ bits}}{\text{cycle}}\right)^{-1}$

$= \boxed{375 \text{ ns}}$

b. $t_{parallel} = \underline{6 \text{ symbols}} \times \left(\frac{8 \text{ bits}}{\text{symbol}}\right) \times \left(\frac{\text{sec}}{4.17 \times 10^6 \text{ cycles}}\right) \times \left(\frac{\text{cycle}}{8 \text{ bits}}\right)$

$\approx \boxed{1.44 \text{ ms}}$

(5 min)