Timing Diagram Quiz Questions:

Suppose an 8086 is operating in a way such that duty cycle is 1/3th of the total time required for one clock pulse. Consider the frequency is 8MHz. Now the 8086 is going to execute the instruction MOV AX, [2315h] i.e. 16 bits of data will be read from memory. Determine the total time required for the instruction to complete.

Ans: Instruction Cycle = 2 Bus Cycle

f = 8Mhz
t = 1/8 * 10^3 ns
Bus cycle = T1+T2+T3+T4 = 4(1/8) * 10^3ns = 500 ns
I.C = 500*2 = 1000 ns

Suppose an 8086 is operating in a way such that duty cycle is 1/4th of the total time required for one clock pulse. Consider the Ton = 20ns. Now the 8086 is going to execute the instruction MOV CL, [2313h] i.e. 8 bits of data will be read from memory. Determine the total time required for the instruction to complete.

Ans: Instruction Cycle = 1 Bus Cycle
T = 20 * 4 = 80 ns
Bus cycle = T1+T2+T3+T4 = 4* 80 ns = 320 ns
I.C = 320 ns

Suppose an 8086 is operating in a way such that duty cycle is 1/3th of the total time required for one clock pulse. Consider the Toff = 20ns. Now the 8086 is going to execute the instruction MOV CX, [2312h] i.e. 16 bits of data will be read from memory. Determine the total time required for the instruction to complete. [There was a similar question to this one]

Ans: (t-t/3) = 20 ns
t = 30 ns

Instruction Cycle = 2 Bus Cycle
Bus cycle = T1+T2+T3+T4 = 4*30 = 120 ns
I.C = 120*2 = 240 ns

Pin Description Quiz Questions:

Explain the concept of Multiplexing/Demultiplexing in 8086, with an example.
Ans: Follow slide

Memory Banks Quiz Questions:

1.Consider the following instructions and determine the values and explanation for

Size of the data being transferred
Value of A_0, $\overline{BHE}$ and data cycles in **sequence** along with the memory bank selection

1. MOV AX,[0A43Ch] Ans: A0 = 0 BHE = 0, 1 cycle
2. MOV CL,[42h] Ans: A0 = 0, BHE = 1, 1 cycle
3. MOV AX,[5240h+A391h] Ans: 2 cycle, 1) A0 = 0, BHE = 1 2) A0 = 1, BHE = 0.
4. MOV CL,[9211h] Ans: 1 cycle, A0 = 1, BHE = 0.

2.Consider the following instructions and determine the values and explanation for

Size of the data being transferred
Value of A_0, $\overline{BHE}$ and data cycles in **sequence** along with the memory bank selection

1. MOV DX,[9211h] Ans: 2 cycle, 1) A0 = 0, BHE = 1 2) A0 = 1, BHE = 0.
2. MOV AX,[0B922h] Ans: A0 = 0 BHE = 0, 1 cycle
3. MOV CL,[42h] Ans: A0 = 0, BHE = 1, 1 cycle
4. MOV AX,[A391h+01h] Ans: A0 = 0 BHE = 0, 1 cycle

Let's say we have a memory, which have 8 segments. please explain what will be the length of the data bus of that microprocessor, and why ?

Ans: 8*8 = 64 Data Bus, For explanation follow slide or book.

Let's say we have a 32 bit microprocessor, please explain how memory will be segmented for this microprocessor ?

Ans: 32/8 = 4 Memory Banks, For explanation follow slide or book.

Let's say we have a 8 bit microprocessor, please explain how memory will be segmented for this microprocessor ?

Ans: 1 memory bank needed, For explanation follow slide or book.