Practice Questions

[C01, C02] **1.**. Suppose a microprocessor has a duty cycle of 40%. Suppose the clock is **ON for 80ns**.

a. Calculate the duration of **one clock state**. [2 mark]

b. Calculate the duration of **one Machine Cycle**. [1 mark]

c. Suppose the microprocessor is executing the following read instructions:

i). **MOV AH, [01212H]**
State the duration of **instruction cycle** [1 mark]

ii). **MOV BX**, **[00002H]**
Calculate the **instruction cycle** [2 marks]

d. **Using the instruction [ii] given in c,** state and explain the pin $\mathbf{A_0}$ and **BHE'** values in each bus cycle. [4 marks]

[C01, C02] 2. Consider a microprocessor of **22 MHz**.

a. Calculate the duration of **one clock state in nanoseconds**. [2 mark]

b. Calculate the duration of **one Machine Cycle**. [1 mark]

c. Suppose the microprocessor is executing the following read instructions:

i). **MOV AH, [10246 H]**
State the duration of **instruction cycle** [1 mark]

ii). **MOV BX**, **[33147H]**
Calculate the **instruction cycle** [2 marks]

d. **Using the instruction [ii] given in c,** state and explain the pin $\mathbf{A_0}$ and **BHE'** values in each bus cycle. [4 marks]

[CO4] 3. **Describe** the role of Interrupt Service Register [ISR], Interrupt Mask Register [IMR] and Interrupt Request Register. [6 marks]

[C04] 4. Suppose, you need to service 24 hardware interrupts on your 8086 **State** the name of process to connect multiple PICs with the microprocessor. [1 mark]

a. **Explain** how PICs are connected the master PIC. [2 marks]
b. **Calculate** the minimum number of PICs required. [2 marks]

[C05] 5. **Illustrate** the way DMA operates. You may draw a diagram if you need. [4 marks]microprocessor.

[C04] 6.

Suppose, the **Interrupt Vector** (IV) of an **Interrupt Service Routine** (ISR) is **12E5Ch** whose segment address is stored at memory locations **0008Eh** and **0008Fh**. If the segment address of this IV is 1234h, then, answer the following questions:

A. **Calculate** the value at memory location 0008Dh [6]
B. Calculate the **Interrupt type** responsible for the above **ISR** [2]

7.

[C04] Suppose an 8086 microprocessor is serving interrupt requested via IR3 of PIC. Now there is a request via IR2 while IR 3 is being serviced. Explain how PIC deals with this. You should include in your answer the values of Interrupt Service Register [ISR] and Interrupt Request Register bit value [IRR]. [5 marks]