



**SUM-2024**

# Assignment-1

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Microprocessors and  
Microcontrollers - A

Ans to the ques no: 2

(12)

$$\text{bus time} = (200 + 300) = 500 \text{ ns}$$

$$\text{actual time} = (20,000,500 - 500) \text{ ns}$$

$$= 20,000,000 \text{ ns}$$

$$= (2 \times 10^7 \times 10^{-9}) \text{ sec}$$

$$= 0.02 \text{ sec}$$

$$2048 \text{ bytes of data} = \frac{2048}{0.02} \text{ b/s}$$

$$= \frac{102400}{2^{10}} \text{ kB/s}$$

$$= 100 \text{ kB/s}$$

(Ans)

(11)

burst mode:

$$\text{half of data} = \frac{2048}{2} = 1024 \text{ bytes}$$

$$102400 \text{ bytes of data} = 1 \text{ sec}$$

$$1024 \text{ bytes of data} = \frac{1024}{102400} \text{ sec}$$

$$= 0.01 \text{ sec}$$

$$= 10,000,000 \text{ ns}$$

$$\text{Data transfer time} = (10,000,000 + 500) \text{ ns}$$
$$= 10,000,500 \text{ ns}$$

2

cycle stealing mode

rest of data = 1024 bytes

$$\frac{1024}{4} = 256 \text{ cycles}$$

102400 bytes of data = 1 sec

$$4 \text{ bytes of data} = \left( \frac{4}{102400} \times 10^9 \right) \text{ ns}$$

$$= 39062.5 \text{ ns}$$

$$= (39062.5 + 500) \text{ ns}$$

$$= 39562.5 \text{ ns}$$

$$\text{data transfer time} = (256 \times 39562.5) \text{ ns}$$

$$= 10128000 \text{ ns}$$

total time

$$= (10000, 500 + 10128000) \text{ ns}$$

$$= 20128500 \text{ ns}$$

$$= 0.0201285 \text{ sec} \quad (\text{Ans})$$



## Ans to the ques no: 2

7A34(H)  $\rightarrow$  0111101000110100

4D12(H)  $\rightarrow$  0100110111000010

(+)

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(7F6(H)  $\rightarrow$  110001111110110

sign flag = 1 (msb = 1)

parity flag = 1 (even number of 1  
in last 8 bits)

carry flag = 0 [no carry]

overflow flag = 1 (pos + pos = neg)

Ans to the ques no: 3

(1)

DS : BX

$$\begin{array}{r} 4C280(H) [DS \times 10] \\ + 0100(H) [BX] \\ \hline = 4C280(H) \end{array}$$

$$\text{segment register} = \frac{PA - \text{offset}}{10}$$

$$= \frac{4C280(H) - B290(H)}{10}$$

$$= \frac{40FF0(H)}{10}$$

$$= 40FF(H)$$

Ans

(11)

Last physical address of code segment:

$$\begin{array}{r} E47B0(H) [CS \times 10] \\ + FFFF(H) [Last offset] \\ \hline = F47AF(H) \end{array}$$

Ans