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Section: 02

CSE 341  
Assignment 01

Ans: to: the - Q: No - 01

Given that,

$$CS = 25H$$

$\therefore CS = 0250H$  (segment address shifted by 4 bit positions)

Now,

$$\begin{array}{r} CS = 0000 \quad 0010 \quad 0101 \quad 0000 \\ \text{offset} = 0000 \quad 0000 \quad 0000 \quad 0001 \\ \hline 0000 \quad 0010 \quad 0101 \quad 0001 \end{array}$$

$\therefore$  second physical address of this segment =  $00251H$

Again,

$$\begin{array}{r} CS = 0000 \quad 0010 \quad 0101 \quad 0000 \\ \text{offset} = 1111 \quad 1111 \quad 1111 \quad 1110 \\ \hline 10000 \quad 0010 \quad 0100 \quad 1110 \end{array}$$

$\therefore$  Second to last physical address of this segment  
=  $1024EH$

(Ans:)

Ans: to: the - Q: No - 02

To design a microwave and in need of a processing unit I would choose a microcontroller for designing a microwave.

Microcontroller contains the processing unit, memory and programmable I/O. So, it is helpful for designing microwave. Reasons of using microcontroller are -

- A microcontroller is used where task is simple, fixed and predefined.

- Microcontrollers use low power and RAM.

- It costs lower than microprocessor.

For the above reasons I would choose a microcontroller rather than using a microprocessor.

Ans: to: the- Q: No-03

"The data bus is bidirectional but the address bus is unidirectional."

The data bus is bidirectional because the microprocessor can read the data from the memory as well as writes the processed data back to the memory. Which means, data bus comes to the data which are to be executed. Since the data flow from RAM, ROM or I/O device to CPU and after execution it flows back to the RAM or I/O device.

As well as, address bus is unidirectional because the microprocessor is addressing a specific memory location. Also, no outside devices cannot write into microprocessor. Which means, address bus comes memory address of the instruction which are to be executed. Since the address bus needs to go from CPU to ROM, RAM or I/O devices. That's why the data bus is bidirectional and the address bus is unidirectional.

Ans: to: the - Q: No - 04

Given that,

physical location = A6BA1 H

Base address = 1234

We know,

$$\text{physical location} = (\text{segment address} \times 10 \text{ H}) + \text{offset}$$

$$\Rightarrow \text{A6BA1 H} = 12340 \text{ H} + \text{offset}$$

$$\begin{aligned}\Rightarrow \text{offset} &= \text{A6BA1 H} - 12340 \text{ H} \\ &= 94861 \text{ H}\end{aligned}$$

We know, to address a location offset value must be in 16 bits. Which means, the range of the offset value will be 0000 to FFFF. But here we get the value of offset is 94861 H which is in 20 bits and this is not possible. So, the offset value to address this location must be in 16 bits.

(Ans:)



Ans: to: the Q: No-05

Given that,

physical memory = 16 MB

We know,

$$1 \text{ MB} = 2^{20} \text{ bits}$$

$$\therefore 16 \text{ MB} = (16 \times 2^{20}) \text{ bits}$$

$$= (2^4 \cdot 2^{20}) \text{ bits}$$

$$= 2^{24} \text{ bits}$$

So, for this case of 16 MB of total physical memory the size of the address bus will be 24 bits.

(Ans:)

Ans: to the - Q: No - 06

Given that,

$$\text{physical address} = 3BD15 \text{ H}$$

$$\text{offset} = 1234 \text{ H}$$

We know,

$$\text{Base address} = \frac{\text{physical address} - \text{offset}}{10 \text{ H}}$$

$$= \frac{(3BD15 - 1234) \text{ H}}{10 \text{ H}}$$

$$= \frac{3AAE1 \text{ H}}{10 \text{ H}}$$

Here, we can see there is a problem with the base address. The base address should be such that dividing the 20 bit base address by  $10 \text{ H}$ , should leave no remainder. So, if we divide the base address by  $10 \text{ H}$  there remains a remainder of 1. So, the base address occurs the above problem.

(Ans:)

Ans: to: the - Q: No-07

A specific physical address can have more than two logical addresses.

While overlapping occurs there are two segments in physical address. In microprocessor physical address is the addition of logical address and offset value. Based on offset value one logical address will give different physical address. For example -

BBAD : 1230

$$\begin{aligned}\therefore \text{Physical address} &= (\text{BBAD} \times 10 \text{ H}) + 1230 \\ &= \text{BCD00 H}\end{aligned}$$

BBAC : 1240

$$\begin{aligned}\therefore \text{Physical address} &= (\text{BBAC} \times 10 \text{ H}) + 1240 \\ &= \text{BCD00 H}\end{aligned}$$

BBAB : 1250

$$\therefore \text{Physical address} = (\text{BBAB} \times 10 \text{ H}) + 1250 \\ = \text{BCDC00 H}$$

Here, we can see that it is possible for a specific physical address to have two or more logical addresses.

Ans: to: the - Q: No-08

Given that,

$$\text{CS} = 1000 \text{ H}$$

$$\text{ES} = 3000 \text{ H}$$

$$\text{DS} = 2000 \text{ H}$$

$$\text{SS} = 4000 \text{ H}$$

$$\text{SI} = 1234 \text{ H}$$

We know,

SI is the source index register whose offset is stored in Data segment DS.

$\therefore$  The physical address for the given command

$$\text{will be} = \text{DS} \times 10 \text{ H} + \text{SI}$$

$$= (2000 \times 10 \text{ H}) + 1234$$

$$= (20000 + 1234) \text{ H}$$

$$= 21234 \text{ H}$$

(Ans.)