Examples of Lecture 4
Computer Technology

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Assistant Prof. Dr. Emad I Abdul Kareem

College of Education

Computer Science Department

الجامعة المستنصرية| Mustansiriyah University

Lecture 4

Memory Examples

Example 1: A certain memory chip is specified as 2K×8.

1. How many words can be stored on this chip?

2. What is the words size?

3. How many total bits can this chip store?

SOLUTION:

1. 2K =2 × 1024 = 2048 words

2. The word size is 8-bits (1 byte).

3. Capacity = 2048 × 8 = 16 KB. Memory chip

Example 2: A certain memory chip is specified as 2K × 16

1. How many words can be stored on this chip?

2. What is the words size?

3. How many total bits can this chip store?

SOLUTION:

1. 2K = 2 × 1024 = 2048 words

2. The word size is 16 - bits (2 byte).

3. Capacity = 2048 * 16 = 32KB.

Example 3: Which memory stores the most number of bits 2MG × 8 memory or 2MG × 16 memory?

SOLUTION:

2MG=2 × 1024 × 1024 = 2×(1048576) =2097152 words

Capacity **2MG × 8** = (2 × 1024 ×1024) × 8 = 16,777,216 bits.

Capacity **2MG × 16** = (2 × 1024 ×1024) ×16= 33,554,432 bits.

So 2MG × 16 memory is bigger than 2MG × 8

Example 4: Which memory stores the most number of bits 4MG × 8 memory or 2MG × 16?

SOLUTION:

4MG = 4 × 1024 × 1024 = 4×(1048576) = 4194304 words

Capacity = (4 × 1024 ×1024) × 8 =33,554,432 bits.

Capacity = (2 × 1024 × 1024) ×16= 33,554,432 bits.

So 4MG × 8 and 2MG × 16 memory are equal.

Example 5: A certain memory has a capacity of 4K × 8

1. How many data I/P & data O/P lines?

2. How many word address line?

3. What is its capacity in byte?

SOLUTION:

1. 8 each line

   So data I/P lines = data O/P lines = 8

2. 4 × 1024 = 4096 words

Thus, there are 4096 memory address

$2^{x} = 2^{12} = 4096$

So X=12 it required a 12 bit address line

3. The capacity = (4 ×1024) × 8= 32,768 bit = 32,769 / 8 = 4096 byte

(Since 1byte = 8 bit).

Example: the a certain memory has a capacity of 4K×16

1. How many data I/P & data O/P lines?

2. How many word address lines?

3. What is its capacity in byte?

SOLUTION:

1. 16 each one.

Data I/P lines = data O/P lines =16

2. 4 × 1024 = 20496 words

Thus, there are 4096 memory addresses.

$4096 = 2^{12}$

It is require a 12-bit address line.

3. Capacity = (4 × 1024) × 16 = 65,536 bit

= 65,536 / 8 = 8.192 byte