

Value of: %eax



6

Memory		Registers	
Address	Value	Reg	Value
0x0800	0x0015	%eax	0x0001
0x0804	0x0806	%ebx	0x0800
0x0808	0xABCD	%ecx	0x0030
0x080C	0xFFFF	%edx	0x0004

Assume all values stored in memory are 32 bits.

▲ 0x0001

◆ 0x0800

● 0x0030

■ 0x0015

Value of: %eax



6

Memory		Registers	
Address	Value	Reg	Value
0x0800	0x0015	%eax	0x0001
0x0804	0x0806	%ebx	0x0800
0x0808	0xABCD	%ecx	0x0030
0x080C	0xFFFF	%edx	0x0004

Assume all values stored in memory are 32 bits.

▲ 0x0001

◆ 0x0800

● 0x0030

■ 0x0015

Value of: \$0x0808



19

Memory		Registers	
Address	Value	Reg	Value
0x0800	0x0015	%eax	0x0001
0x0804	0x0806	%ebx	0x0800
0x0808	0xABCD	%ecx	0x0030
0x080C	0xFFFF	%edx	0x0004

Assume all values stored in memory are 32 bits.

▲ 0x0404

◆ 0x0808

● 0xABCD

■ 0x0800

Value of: \$0x0808



19

Memory		Registers	
Address	Value	Reg	Value
0x0800	0x0015	%eax	0x0001
0x0804	0x0806	%ebx	0x0800
0x0808	0xABCD	%ecx	0x0030
0x080C	0xFFFF	%edx	0x0004

Assume all values stored in memory are 32 bits.

▲ 0x0404

◆ 0x0808

● 0xABCD

■ 0x0800

Value of: (%ebx)



18

Memory		Registers	
Address	Value	Reg	Value
0x0800	0x0015	%eax	0x0001
0x0804	0x0806	%ebx	0x0800
0x0808	0xABCD	%ecx	0x0030
0x080C	0xFFFF	%edx	0x0004

Assume all values stored in memory are 32 bits.

▲ 0x0800

◆ 0x0030

● 0xFFFF

■ 0x0015

Value of: (%ebx)



18

Memory		Registers	
Address	Value	Reg	Value
0x0800	0x0015	%eax	0x0001
0x0804	0x0806	%ebx	0x0800
0x0808	0xABCD	%ecx	0x0030
0x080C	0xFFFF	%edx	0x0004

Assume all values stored in memory are 32 bits.

▲ 0x0800

◆ 0x0030

● 0xFFFF

■ 0x0015

Value of: **0x804(%edx)**



25

Memory		Registers	
Address	Value	Reg	Value
0x0800	0x0015	%eax	0x0001
0x0804	0x0806	%ebx	0x0800
0x0808	0xABCD	%ecx	0x0030
0x080C	0xFFFF	%edx	0x0004

Assume all values stored in memory are 32 bits.

▲ **0xABCD**

◆ **0x0806**

● **0x0804**

■ **0xFFFF**

Value of: **0x804(%edx)**



25

Memory		Registers	
Address	Value	Reg	Value
0x0800	0x0015	%eax	0x0001
0x0804	0x0806	%ebx	0x0800
0x0808	0xABCD	%ecx	0x0030
0x080C	0xFFFF	%edx	0x0004

Assume all values stored in memory are 32 bits.

▲ **0xABCD**

◆ **0x0806**

● **0x0804**

■ **0xFFFF**

Value of: `11(%ebx, %eax)`



27

Memory	
Address	Value
0x0800	0x0015
0x0804	0x0806
0x0808	0xABCD
0x080C	0xFFFF

Registers	
Reg	Value
%eax	0x0001
%ebx	0x0800
%ecx	0x0030
%edx	0x0004

Assume all values stored in memory are 32 bits.

▲ 0x080C

◆ 0x000B

● 0xFFFF

■ 12

Value of: **11(%ebx, %eax)**



27

Memory	
Address	Value
0x0800	0x0015
0x0804	0x0806
0x0808	0xABCD
0x080C	0xFFFF

Registers	
Reg	Value
%eax	0x0001
%ebx	0x0800
%ecx	0x0030
%edx	0x0004

Assume all values stored in memory are 32 bits.

▲ 0x080C

◆ 0x000B

● 0xFFFF

■ 12

Value of: `0x800(%edx,%eax,8)`



50

Memory	
Address	Value
0x0800	0x0015
0x0804	0x0806
0x0808	0xABCD
0x080C	0xFFFF

Registers	
Reg	Value
%eax	0x0001
%ebx	0x0800
%ecx	0x0030
%edx	0x0004

Assume all values stored in memory are 32 bits.

▲ 0x080C

◆ 0x0800

● 0xFFFF

■ 13

Value of: **0x800(%edx,%eax,8)**



50

Memory	
Address	Value
0x0800	0x0015
0x0804	0x0806
0x0808	0xABCD
0x080C	0xFFFF

Registers	
Reg	Value
%eax	0x0001
%ebx	0x0800
%ecx	0x0030
%edx	0x0004

Assume all values stored in memory are 32 bits.

▲ 0x080C

◆ 0x0800

● 0xFFFF

■ 13

Which of these jumps does something different?



56

One of these
things
is not like
the others

▲ jb

◆ jnae

● jae

■ jc

Which of these jumps does something different?



56

One of these
things
is not like
the others

▲ jb

◆ jnae

● jae

■ jc

Which number doesn't equal the others?



58



▲ 5C (hex)

◆ 91 (decimal)

● 01011100 (binary)

■ 134 (octal)

Which number doesn't equal the others?



58



▲ 5C (hex)

◆ 91 (decimal)

● 01011100 (binary)

■ 134 (octal)

Starting with `eax = 21`, which results in a different value?



58



▲ `movl $42, %eax`

◆ `shll $1, %eax`

● `leal $0(,%eax,2), %eax`

■ `shrl $1, %eax`

Starting with `eax = 21`, which results in a different value?



58



▲ `movl $42, %eax`

◆ `shll $1, %eax`

● `leal $0(,%eax,2), %eax`

■ `shrl $1, %eax`

Which results in a different SP (stack pointer) value?



57

One of these things is not like the others,
one of these things just isn't the same...



▲ sub \$4, esp

◆ pop %ebx

● add \$4, esp

■ pop %eax

Which results in a different SP (stack pointer) value?



57

One of these things is not like the others,
one of these things just isn't the same...



▲ sub \$4, esp

◆ pop %ebx

● add \$4, esp

■ pop %eax

Which of these is not an x86 register?



17



▲ rax

◆ esp

● pox

■ rip

Which of these is not an x86 register?



17



▲ rax

◆ esp

● pox

■ rip

A cache has a 94% hit ratio, 2ns hit time and 100ns miss penalty. What is the average access time.



58

AMAT = Hit-time +
(Miss-Rate x Miss-Penalty)

Average Memory Access Time

▲ 8ns

◆ 62ns

● 6ns

■ Not enough information.

A cache has a 94% hit ratio, 2ns hit time and 100ns miss penalty. What is the average access time.



58

AMAT = Hit-time +
(Miss-Rate x Miss-Penalty)

Average Memory Access Time

▲ 8ns

◆ 62ns

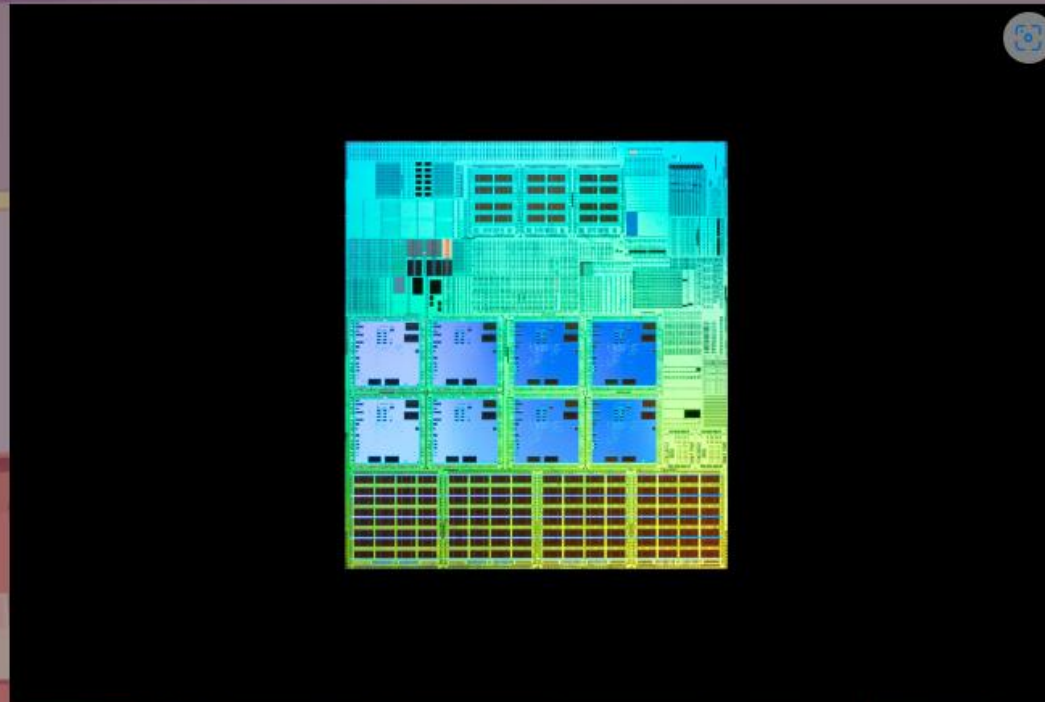
● 6ns

■ Not enough information.

Select all correct statements about cache memory.



16



Submit

Select one or more answers!

▲ There can be multiple layers of cache.

◆ Some processors have separate cache memory for code and data.

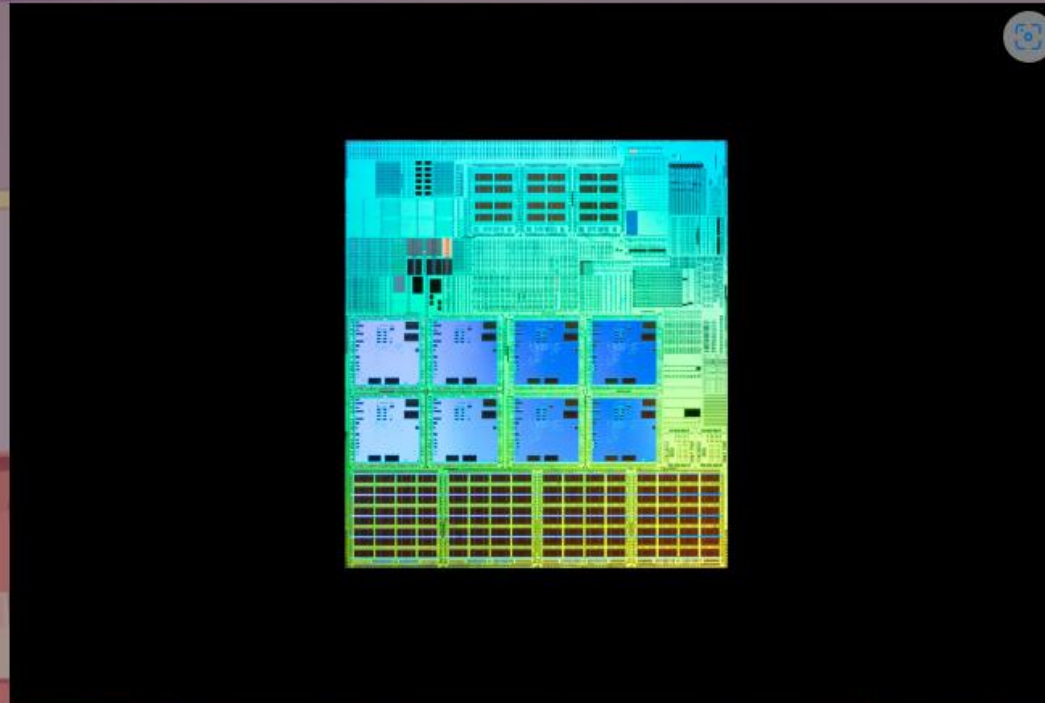
● Contemporary processors keep most or all cache memory on the chip.

■ Cache memory is usually static RAM.

Select all correct statements about cache memory.



16



Submit

Select one or more answers!

There can be multiple layers of cache.

Some processors have separate cache memory for code and data.

Contemporary processors keep most or all cache memory on the chip.

Cache memory is usually static RAM.

Order memory types from fastest to slowest.



Submit

Drag the tiles to arrange them in the correct order.

▲ Main Memory

◆ Registers

● On-Chip Cache

■ Disk or SSD storage

28



Order memory types from fastest to slowest.



Correct

+ 587

Next



Registers



On-Chip Cache



Main Memory



Disk or SSD storage



Show media

Which is NOT a dimension in disk storage.



18



▲ Sector

◆ Track

● Surface

■ Grid

Which is NOT a dimension in disk storage.



18



▲ Sector

◆ Track

● Surface

■ Grid