**Chapter 1 – Computer Systems Overview**

**TRUE/FALSE QUESTIONS:**

T F 1)  The processor controls the operation of the computer and performs its

data processing functions.

T F 2)  It is not possible for a communications interrupt to occur while a printer

interrupt is being processed.

T F 3)  A system bus transfers data between the computer and its external environment.

T F 4)  Cache memory is invisible to the OS.

T F 5)  With interrupts, the processor can not be engaged in executing other instructions

while an I/O operation is in progress.

T F 6)  Digital Signal Processors deal with streaming signals such as audio and video.

T F 7)  The fetched instruction is loaded into the Program Counter.

T F 8)  Interrupts are provided primarily as a way to improve processor utilization.

T F 9)  The interrupt can occur at any time and therefore at any point in the execution

of a user program.

T F 10)  Over the years memory access speed has consistently increased more rapidly

than processor speed.

T F 11)  An SMP can be defined as a stand-alone computer system with two or more similar

processors of comparable capability.

T F 12)  The Program Status Word contains status information in the form of condition codes,

which are bits typically set by the programmer as a result of program operation.

T F 13)  An example of a multicore system is the Intel Core i7.

T F 14)  In a two-level memory hierarchy the Hit Ratio is defined as the fraction of all

memory accesses found in the slower memory.

T F 15)  The operating system acts as an interface between the computer hardware and

the human user.

**MULTIPLE CHOICE QUESTIONS:**

1)  The four main structural elements of a computer system are:

A)  Processor, Main Memory, I/O Modules and System Bus

B)  Processor, I/O Modules, System Bus and Secondary Memory

C)  Processor, Registers, Main Memory and System Bus

D)  Processor, Registers, I/O Modules and Main Memory

2)  The \_\_\_\_\_\_\_\_\_\_ holds the address of the next instruction to be fetched.

A)  Accumulator (AC)   B)  Instruction Register (IR)

C)  Instruction Counter (IC)   D)  Program Counter (PC)

3)  The \_\_\_\_\_\_\_\_\_\_ contains the data to be written into memory and receives the data

read from memory.

A)  I/O address register   B)  memory address register

C)  I/O buffer register   D)  memory buffer register

4)  Instruction processing consists of two steps:

A)  fetch and execute   B)  instruction and execute

C)  instruction and halt   D)  fetch and instruction

5)  The \_\_\_\_\_\_\_\_\_\_\_ routine determines the nature of the interrupt and performs whatever

actions are needed.

A)  interrupt handler   B)  instruction signal

C)  program handler   D)  interrupt signal

6)  The unit of data exchanged between cache and main memory is \_\_\_\_\_\_\_\_\_\_ .

A)  block size   B)  map size

C)  cache size   D)  slot size

7)  The \_\_\_\_\_\_\_\_\_ chooses which block to replace when a new block is to be loaded into the

cache and the cache already has all slots filled with other blocks.

A)  memory controller   B)  mapping function

C)  write policy   D)  replacement algorithm

8)  \_\_\_\_\_\_\_\_\_\_ is more efficient than interrupt-driven or programmed I/O for a

multiple-word I/O transfer.

A)  Spatial locality   B)  Direct memory access

C)  Stack access   D)  Temporal locality

9)  The \_\_\_\_\_\_\_\_\_\_ is a point-to-point link electrical interconnect specification that enables

high-speed communications among connected processor chips.

A)  QPI   B)  DDR3

C)  LRUA   D)  ISR

10)  Small, fast memory located between the processor and main memory is called:

A)  Block memory   B)  Cache memory

C)  Direct memory   D)  WORM memory

11)  In a uniprocessor system, multiprogramming increases processor efficiency by:

A)  Taking advantage of time wasted by long wait interrupt handling

B)  Disabling all interrupts except those of highest priority

C)  Eliminating all idle processor cycles

D)  Increasing processor speed

12)  The two basic types of processor registers are:

A)  User-visible and user-invisible registers

B)  Control and user-invisible registers

C)  Control and Status registers

D)  User-visible and Control/Status registers

13)  When an external device becomes ready to be serviced by the processor the device

sends a(n) \_\_\_\_\_\_\_\_\_ signal to the processor.

A)  access   B)  halt

C)  handler   D)  interrupt

14)  One mechanism Intel uses to make its caches more effective is \_\_\_\_\_\_\_\_\_\_ , in which the

hardware examines memory access patterns and attempts to fill the caches speculatively

with data that is likely to be requested soon.

A)  mapping   B)  handling

C)  interconnecting   D)  prefetching

15)  A \_\_\_\_\_\_\_\_\_\_ organization has a number of potential advantages over a uniprocessor

organization including performance, availability, incremental growth, and scaling.

A)  temporal locality   B)  symmetric multiprocessor

C)  direct memory access   D)  processor status word

**SHORT ANSWER QUESTIONS:**

1. The invention of the \_\_\_\_\_\_\_\_\_ was the hardware revolution that brought about desktop and

handheld computing.

1. To satisfy the requirements of handheld devices, the classic microprocessor is giving way to the

\_\_\_\_\_\_\_\_\_ , where not just the CPUs and caches are on the same chip, but also many of the other

components of the system, such as DSPs, GPUs, I/O devices and main memory.

3)  The processing required for a single instruction is called a(n) \_\_\_\_\_\_\_\_\_\_ cycle.

4)  The fetched instruction is loaded into the \_\_\_\_\_\_\_\_\_\_ .

5)  When an external device is ready to accept more data from the processor, the I/O module for

that external device sends an \_\_\_\_\_\_\_\_\_\_ signal to the processor.

6)  The \_\_\_\_\_\_\_\_\_\_ is a device for staging the movement of data between main memory and processor

registers to improve performance and is not usually visible to the programmer or processor.

7)  External, nonvolatile memory is also referred to as \_\_\_\_\_\_\_\_\_\_ or auxiliary memory.

8)  When a new block of data is read into the cache the \_\_\_\_\_\_\_\_\_\_ determines which cache location

the block will occupy.

9)  In a \_\_\_\_\_\_\_\_\_ multiprocessor all processors can perform the same functions so the failure of a

single processor does not halt the machine.

10)  A \_\_\_\_\_\_\_\_\_\_ computer combines two or more processors on a single piece of silicon.

11)  A Control/Status register that contains the address of the next instruction to be fetched is

called the \_\_\_\_\_\_\_\_\_.

12)  Each location in Main Memory contains a \_\_\_\_\_\_\_\_\_ value that can be interpreted as either

an instruction or data.

13)  A special type of address register required by a system that implements user visible stack

addressing is called a \_\_\_\_\_\_\_\_\_\_ .

14)  Registers that are used by system programs to minimize main memory references by optimizing

register use are called \_\_\_\_\_\_\_\_\_\_ .

15)  The concept of multiple programs taking turns in execution is known as \_\_\_\_\_\_\_\_\_\_.