Chapter 1

3) As a matter of necessity, network interfaces must conform to standard agreement, know as____ , for messages to be understood by both computers during a message exchange between a pair of computers

a) protocols

4) The components of an individual computer system consist of processing hardware, input device, output device, storage device,

c) application software and operating system software

5) The_____ provides the physical mechanisms to input and output data, to manipulate and process data, and to electronically control the various input, output, and storage components.

c) computer hardware

6) What is the only requirement for data to be manipulated and processed by a computer?

b) The data must be represented in binary form

7) Which of the following is not part of the conceptual view of a CPU?

d) Main memory

8) The main memory, often known as primary storage, working storage, or RAM (random access memory), holds

c) program instructions and data

9) The idea that the program instructions and data are both stored in memory while-------processed is known as the

b) stored program concept

10) Many of the internal OS services are provided by the ____ module, w----the most important operating system processing functions.

c) kernel

11) The operating system's _____ acts as an interface for appli---- ----ograms and utilities to access the internal services provided by the operating system.

d) application program interface

12) When the computer is started, a bootstrap or IPL(Initial Program Load) begins t---- system. Where is this bootstrap program stored?

b) ROM

13) The fact that different types of computers can work together, share files, and c---- successfully is know as

b) open computing

14) The word, “virtual”, as used in the text, is most synonymous with which word?
a) logical

15) _____ are agreements among interested parties, often manufacturers, to assure that various system components will work together interchangeably.
b) Standards

16) Unicode is a(n)
a) character encoding standard

Chapter 2 An introduction to System Concepts

1) From a systems perspective, how would you classify a computer operating system?
a) A tangible system
b) A physical system
c) A conceptual system
d) A perceptible system

Section 2.1

2) Anything outside the system boundary represents the _____ that the system operates.
a) interface
b) subsystem
c) environment
d) super system

3) A large organization’s IT system might have specific programs such as marketing, manufacturing, purchasing, inventory, finance, and accounting. These are considered _____ to the larger IT system.
a) interface
b) subsystems
c) environment
d) super system

4) The division of a system or subsystem into its components and linkage is called
a) itemization
b) reconstruction
c) decomposition
d) categorization

5) What is not part of an abstract description of system architecture?
a) system constraints

b) systeminterconnections
c) linkage among the components
d) physical location of the servers

6) Which of the following are not input devices?
a) stylus
b) headphones
c) touch screen
d) mouse and keyboard

7) The system architecture representation of the flow and processing of data within an organization is called
a) three-tier architecture
b) application architecture
c) flow control architecture
d) customer oriented architecture

Section2.2

8) Scalability is the ability of a system to
a) handle a growing amount of work
b) allow access to information when it is needed
c) protect data against unauthorized access or modification
d) allow configuration, monitoring, and maintaining operation

9) Information availability is the ability of a system to
a) handle a growing amount of work
b) allow access to information when it is needed
c) protect data against unauthorized access or modification
d) allow configuration, monitoring, and maintaining operation

10) Data security is the ability of a system to
a) handle a growing amount of work
b) allow access to information when it is needed
c) protect data against unauthorized access or modification
d) allow configuration, monitoring, and maintaining operation

11) System administration is the ability of a system to
a) handle a growing amount of work
b) allow access to information when it is needed
c) protect data against unauthorized access or modification
d) allow configuration, monitoring, and maintaining operation

12) In a client-server architecture, the only limitations to running multiple applications on a single

server are the potential slowdowns that may results from the load on the server computer and
a) traffic on the Internet
b) load on client computer
c) users who open many web browsers
d) the traffic on the network to that server

13) A two-tier architecture simply means that there are _____ computers involved in the service
a) one
b) two
c) two to five
d) two or more

14) A web-browser connected to a web-server is an example of
a) multiprocessing
b) cluster computing
c) n-tier architecture
d) client-server technology

15) Because response time is considered an important measure by most Web users, it is often more practical to separate the database and page processing into a third computer system. This is an example of
a) multiprocessing
b) cluster computing
c) n-tier architecture
d) three-tier architecture

16) The protocol that makes communication between a Web server and a database application possible is called D
a) SQL
b) HTTP
c) Database Control Language
d) Common Gateway Interface

17) _____ is software designed to handle potential incompatibilities between the application software that resides on different equipment.
a) Middleware
b) Versioning software
c) Compatibilities software
d) Application interface software

18) The organization's internal network is commonly called a(n)
a) intranet
b) employee network
c) corporation network

d) organizational network

19) Internet standards such as ____ allow the easy identification of relevant data within data streams between interconnected systems, making these applications possible and practical.
a) XML
b) FTP
c) SSH
d) HTTPS

20) What is not a benefit of cloud services?
a) Backup and offsite storage
b) Additional computing capability when and where it is needed
c) Lower hardware and software investments
d) Added security

Chapter 3

1) How many binary digits does it take to represent the decimal number 2013?
a) 16
b) 8
c) 11　除以 2 的余数自下而上
d) 2013

Section 3.1

2) How many bytes does it take to store the binary equivalent of the decimal number 1945?
a) 1
b) 2　bytes = 8 bits
c) 4
d) 10

3) The largest number that can be represented 8 bits without considering a sign is
a) 15
b) 255　2^8=256
c) 65,535
d) 10,000,000

Section 3.2 Counting in Different Bases

4) The largest single digit in octal is
a) 1

b) 7
c) 8
d) 10

5) The largest single digit in hexadecimal is
a) 1
b) 8
c) F
d) 9

6) The binary number 10110011_2 is equivalent to the decimal number
a) 113
b) 179
c) 133
d) 10,110,011

7) Eight raised to the power zero is
a) 0
b) 1
c) 8
d) -8

8) Eight raised to the power one is
a) 0
b) 1
c) 8
d) -8

9) The number of different items that can be represented by a given number of digits, *n*, in a particular base, *b*, is given by the formula: b^n equals _____
a) field
b) radix
c) range
d) parameter

10) The digit with the greatest weight (value) in a number is called the
a) radix
b) heaviest bit
c) least significant digit
d) most significant digit

11) The octal number 12_8 is equivalent to the decimal number
a) 9
b) 10 8^1+8^0x2

c) 24
d) 12

Section 3.3 Performing Arithmetic in Different Number Bases

12) The hexadecimal number $1A_{16}$ is equivalent to the decimal number
a) 9
b) 17
c) 26 16^1+16^0x10
d) 110

13) How many bits are there in one byte?
a) 1
b) 4
c) 8
d) 10

14) A single digit that can have only one of two values, 0 or 1, is a
a) bit
b) blip
c) signal
d) character

15 In order to divide a number by its base we can perform
a) a bit op
b) a left shift
c) a right shift
d) a complex equation
16) In order to multiply a number by its base we can perform
a) a bit op
b) a left shift
c) a right shift
d) a complex equation

17) The base 8 number system is called
a) octal
b) fractal
c) ochodecimal
d) hexadecimal

18) The base 2 number system is called
a) binary
b) fractal
c) bitly

d) radix

19) Which of the following is true?
a) $1_2<1_8$
b) $10_2<1_8$
c) $101_2<10_8$
d) $101_2<5_8$

20) Which of the following is true?
a) $0.1_2>0.1_8$
b) $0.1_2=0.1_8$
c) $0.1_2<0.1_8$
d) None of these

22) The “Exclusive OR” function (used for the result bit when adding single digits in binary) will equal 1 if the input bits are
a) 0+0
b) 0+1
c) 1+1
d) None of these

23) The “AND” function (used for carry bit when adding single digits in binary) will equal 1 if the input bits are
a) 0+0
b) 0+1
c) 1+1
d) None of these

24) The decimal number 9 is equivalent to the hexadecimal
a) A
b) 9
c) 10
d) 1001

Section 3.5 Hexadecimal Numbers and Arithmetic

25) The base 16 number system is called
a) octal
b) fractal
c) sexadecimal
d) hexadecimal

26) To convert from binary to octal by grouping, one octal digit corresponds to how many binary digits?

a) one
b) two
c) three
d) eight

Section 3.6 A Special Conversion Case----Number Bases That Are Related

27) To convert from binary to hexadecimal by grouping, one hexadecimal digit corresponds to how many binary digits?
a) two
b) four
c) eight
d) sixteen

28) Ten raised to the power negative one (10^{-1}) is
a) 1/10
b) -10
c) -1/10
d) None of these

Section 3.7 Fractions

29) The binary number 10.01_2 is equivalent in decimal to
a) 2.01
b) 2.25
c) 4.25
d) 10.01

Chapter 4 Data Formats

1) Input from a device that represents a continuous range of data is known as
a) metadata
b) analog data
c) various data
d) discrete data

Section 4.1 General Considerations

2) Information that describes or interprets the meaning of the data is known as
a) ASCII
b) analog
c) EBCDIC
d) metadata

3) Which of the following is NOT one of the common alphanumeric codes?
a) ASCII
b) Unicode
c) Ordinal
d) EBCDIC

4) When recording sounds, the data that describes how long a time period each captured sound measurement represents is known as the
a) MIDI
b) WAVE
c) amplitude
d) sampling rate

6) Characters used to control the position of the output on the screen or paper, to cause some actions to occur, such as ringing a bell or deleting a character, or to communicate status betweens the computer and an I/0 device are called
a) glyphs
b) symbols
c) control characters
d) command characters

Section 4.2 Alphanumeric Character Data

7) The order of the alphanumeric codes in the representation table, which will determine how data is sorted, is known as
a) metadata
b) scan code
c) control code
d) collating sequence

8) How many bytes are needed to store one ASCII character?
a) 1
b) 2
c) 3
d) 4

9) The presentation of an image as input or output, one pixel at a time, in order, is called
a) metadata
b) sampling
c) a raster scan
d) collating sequence

Section 4.3 Visual Data

10) Image files that store each individual point within the image are
a) glyphs
b) vector images
c) object images
d) bitmap images

11) Images that are defined mathematically as geometrically definable shapes that can be easily moved around, scaled, and rotated without losing their shape and identity are known as
a) GIF images
b) raster images
c) vector images
d) bitmap images

12) An example of an image file that uses lossless compression is
a) TIFF
b) PNG
c) MP3
d) JPEG

13) Which image file format is best used for photographs of real-world object?
a) GIF
b) PNG
c) MP3
d) JPEG

14) The nature of display technology makes it much better convenient and cost effective for regular printer and display screens to display and print all images as
a) palettes
b) bitmaps
c) equations
d) pseudocode

15) The color translation table, which translate the code of each pixel into actual color values, is known as a
a) theme
b) glyph
c) palette
d) color chart

16) The individual elements that form a bitmap image are called
a) pixels
b) palettes
c) grid bits
d) resolution

17) increasing or decreasing number of pixels per inch changes the
a) codec
b) amplitude
c) resolution
d) color depth

18) Making the pixels smaller and increasing their number will result in a
a) corrupt file
b) clearer image
c) loss of quality
d) smaller file size

19) Which of the following is NOT an advantage object images over bitmap images?
a) Easy to create
b) Manipulated easily
c) Resolution independent
d) Require far less storage space

20) In graphically based system it is necessary to distinguish between characters and their object image-based representations, known as
a) PNGs
b) TIFFs
c) icons
d) glyphs

21) Video format is determined by an encoder/decoder algorithm known as a
a) codec
b) modifier
c) converter
d) transformer

22) Video that is transmitted through a network and displayed in real time is called
a) raster
b) flowing
c) streaming
d) post script

23) Original sound waves are analog in nature and must be converted to digital form for use in the computer. The circuit that performs this function is known as a(n)
a) analog inverter
b) digital inverter
c) A-to-D converter
d) digital to analog converter

24) Which of the following waveform metadata would NOT be necessary to process and reproduce the waveform?

a) Genre

b) Sampling rate

c) Maximum amplitude

d) Total number of samples

25) What is the format used to coordinate the sounds and signals between a computer and connected musical instruments, particularity keyboards?

a) MOD

b) VOC

c) WAV

d) MIDI

26) The bit rate of an MP3 file is usually measured in

a) bits per second

b) Kbits per second

c) Mbits per second

d) Gbits per second

27) What is the primary contributor to the small MP3 file size?

a) Lossless compression

b) Psychoacoustic lossy compression

c) Compression, using an algorithm called LZW

d) Compression, similar to that used in .WAV files

28) The .WAV format is a general-purpose format used primarily to store and reproduce

a) text

b) sound

c) movies

d) pictures

29) Lossless data compression must be used for all of these EXCEPT

a) text files

b) program files

c) multimedia files

d) numerical data files

30) ZIP files use

a) lossy algorithms only

b) lossless algorithms only

c) mix of both lossless and lossy algorithms

d) depends on the nature of the data being compressed

31) Most page description languages also provide the capability to extend the language to include new data formats and new objects using language stubs called
a) clients
b) plug-ins
c) web-apps
d) applications

32) A language that describes the layout of objects on a displayed or printed page is called
a) MIDI
b) a palette
c) EBCDIC
d) a page description language

33) which of the following is NOT an example of a page description language
a) PDF
b) PCX
c) HTML
d) PostScript

34) Two-valued variables or constants with values of true or false are called
a) float
b) binary
c) Boolean
d) symbols

35) Numbers with a fractional portion are called
a) real
b) integers
c) Boolean
d) enumerated

Discussion Questions

1) What is the major difference between how JPEG and GIF image files are compressed?

Sol: GIF uses a lossless compression algorithm(LZW); JEPG is a lossy compression algorithm.

2) Why is “metadata” important?

Sol: Metadata contains information about the wave form or graphic image required to process and reproduce the waveform or graphic image. Without metadata, applications would not understand how to process and reproduce the original content.

3) Why is it critical that standard data representations exist?

Sol: From the text:" These data representations must be recognized by a wide variety of hardware and software so that they can be used by users working within different computer environments"

12) What is the main assumption regarding lossy compression?

Sol: From the text:" Lossy algorithms operate on the assumotion that some data can be sacrificed without significant effect, based on the application and on known properties of human perception."

13) Describe the advantages and disadvantages of data compression.

Sol: Files are compressed for reducing their file size but it takes computing power to perform the compression and reverse the compression for use. Smaller files have the advantage of reduced storage and can be transmitted over a network faster. Lossless compression is the only option for files that must maintain their integrity.

14) A loan application takes as input loan amount, credit scores, salary history, tax history and other relevant data and produces a single result: either the customer is credit worthy or not. What data type is the variable "result"?

Sol: Boolean. There are only two possible values. The input data types will vary as integer, float, text or some other data type.

15) What two factors determine how the binary numbers stored in a computer are interpreted? That is ---what determines whether 01000001 is seen as the character "A" or the integer 65?

Sol: From the text:" The interpretation of these [binary numbers stored in the computer] depends upon two factor: The actual operations that the computer processor is capable of performing" and "The data types that are supported by the programming language used to create the application program."

Chapter 5 Representing Numerical Data

1.How do computers store all data and program instruction?

A. As decimal numbers
B. As ASCII characters
C. As binary numbers
D. As algebraic equations

2.The binary numbers in a computer might represent

A. images

B. numbers
C. characters
D. All of the above

3.What numbers are generally manipulated as characters?

A. Zip code
B. Telephone number
C. Grade point average
D. Both a and c

4.When the number to be expressed is outside of the integer range of the computer (too large or too small), or when the number contains a fractional part it must be stored as a(an)

A. constant
B. exponent
C. complement
D. real number

5.An 8-bit storage location can store any unsigned integer of value between 0 and

A. 7
B. 16
C. 255
D. 512

6.What does BCD stand for?

A. Binary-coded Decimal
B. Binary Calculating Device
C. Binary Common Denominator
D. Binary Character Data

7.What is the range of a 1 byte number stored in BCD format?

A. 0-9
B. 0-99
C. 0-999
D. 0-9999

8.How many BCD digits can be stored in one byte?

A. 1
B. 2
C. 7
D. 255

9.What is the most common way to represent negative integers in binary form?

A. As BCD
B. Using 2's complement
C. Using sign-and-magnitude
D. None of the above

10.If we complement the value twice, it will

A. be twice as big
B. return to its original value
C. cause an overflow error
D. reset the carry flag

11.A combination of numbers that produces a result outside the available range is known as

A. overload
B. overflow
C. spillover
D. wraparound

12.Changing every 0 to a 1 and every 1 to a 0 is also known as

A. reversion
B. inversion
C. diversion
D. conversion

13.Using sign-and-magnitude representation, the largest positive number that can be stored in 8 bites is

A. 7
B. 127　负数占另一半
C. 255
D. 512

14.Using sign-and-magnitude representation., if the leftmost bit is 1 the number is

A. positive
B. negative
C. an error
D. a character

15.If both inputs to an addition have the same sign, and the output sign is different then

A. the leftmost bit should wrap around
B. the leftmost bit should be disregarded
C. the range is insufficient to hold the result
D. you must take the complement of the result

16.Using sign-and-magnitude representation, storing the number -12 in 4 bits is

A. 1100
B. 0011
C. 0100
D. impossible　2^4/2=8　+-8

17.In 1's and 2's complement representations, a negative number begins with

A. -1
B. 0
C. 1
D. -0

18.How do you find the 2's complement of positive numbers?

A. Invert the numbers
B. Invert the numbers and add one
C. Invert the numbers and wrap around the leftmost bit
D. Do nothing, the complement is the same as the original

19.How do you find the 2's complement of negative numbers?

A. Invert the numbers
B. Invert the numbers and add one

C. Invert the numbers and wrap around the leftmost bit

D. Do nothing, the complement is the same as the original

20.When adding two numbers using 2's complement, carries beyond the leftmost digit are

A. Inverted

B. Ignored

C. Shifted left

D. Shifted right

21.What is the 8-bit 2's complement representation for -35?

A. 11011101

B. 01011101

C. 11011100

D. 11011111

Chapter 6

1. The load instruction copies data from the

a) in basket to a mailbox

b) calculator to a mailbox

c) in basket to the calculator

d) mailbox to the calculator

2. The STORE instruction copies data from the

a) in basket to a mailbox

b) mailbox to the calculator

c) calculator to a mailbox

d) in basket to the calculator

3. The ADD instruction adds data from

a) the in basket to a mailbox

b) a mailbox to the calculator

c) a mailbox to the in basket

d) one mailbox to another mailbox

4. The SUBTRACT instruction subtracts data in

a) the calculator from a mailbox

b) the in basket from a mailbox

c) a mailbox from the calculator

d) one mailbox from another mailbox

5. The INPUT instruction takes data from the

a) in basket and places it in a mailbox

b) mailbox and places it in the in basket

c) mailbox and places it in the calculator

d) in basket and places it in the calculator

6. The OUTPUT instruction takes data from the
a) out basket and places it in a mailbox
b) mailbox and places it in the out basket
c) out basket and places it in the calculator
d) Calculator and places it in the out basket

7. The COFFEE BREAK(HALT) instruction
a) pauses the program
b) clears all mailboxes
c) empties the out basket
d) ignores the address portion of the instruction

8. A LOAD command will leave the original data in the mailbox
a) deleted
b) corrupted
c) unchanged
d) overwritten

9. A LOAD command will leave the original data in the calculator
a) deleted
b) corrupted
c) unchanged
d) overwritten

10. A STORE command will leave the original data in the mailbox
a) deleted
b) corrupted
c) unchanged
d) overwritten

11. A STORE command will leave the original data in the calculator
a) deleted
b) corrupted
c) unchanged
d) overwritten

12. An ADD command will leave the original data in the mailbox
a) deleted
b) corrupted
c) unchanged
d) overwritten

13. An INPUT command will leave the original data in the calculator

a) deleted
b) corrupted
c) unchanged
d) overwritten

14. An OUTPUT command will leave the original data in the calculator
a) deleted
b) corrupted
c) unchanged
d) overwritten

15. Which sequence of commands is needed to enter two numbers into the LMC (using the INPUT command)?
a) input, add, input
b) input, load, input
c) input, store, input
d) input, enter, input

16. The BRANCH UNCONDITINALLY instruction changes the value in the
a) mailbox
b) calculator
c) out basket
d) program counter (also called instruction location counter)

17. The BRANCH ON ZERO instruction “jumps” if the value in the
a) mailbox is zero
b) in basket is zero
c) calculator is zero
d) instruction location counter is zero

18. The BRANCH ON POSITIVE instruction “jumps” if the value in the
a) mailbox is positive
b) in basket is positive
c) calculator is positive
d) instruction location counter is positive

19. The instruction cycle can be broken into these two parts
a) fetch and decode
b) fetch and execute
c) decode and execute
d) execute and increment

20. The LMC know which mailbox contains the next task by locating at the
a) calculator

b) in basket
c) current mailbox
d) program counter (instruction location counter)

Chapter 7 The CPU And Memory

1. The Little Main instruction set is based on a decimal number system, real computers encode instructions and data using the
   A. binary system
   B. Unicode system
   C. decimal system
   D. algebraic system
2. The ALU and CU together are known as the
   A. CPU
   B. Instruction set
   C. Program counter
   D. Memory Management Unit
3. The area inside of the CPU that holds data temporarily and performs calculations is called the
   A. accumulator
   B. program counter
   C. arithmetic logic unit
   D. Memory Management Unit
4. The storage locations that are used for a particular defined purpose within the CPU are called
   A. RAM
   B. Storage
   C. The bus
   D. Registers
5. The 1-bit registers that are used to allow the computer to keep track of special conditions (like overflow or power failure) are often called
   A. flags
   B. loops
   C. the ALU
   D. I/O counters
6. Loading the value zero into a register is called
   A. inverting a register
   B. clearing a register
   C. dumping the register
   D. incrementing a register
7. The register that holds the address of the memory location that needs to be accessed is called the
   A. IR
   B. MAR
   C. MDR

D. MBR

8. The register that holds the current instruction is called the
   A. IR
   B. PC
   C. LMC
   D. MBR
9. The register that will hold the data value that is being transferred between the CPU and a particular memory location is called the
   A. PC
   B. ALU
   C. MAR
   D. MDR
10. The mailboxes in the LMC model are the equivalent to a real computer's
   A. CPU
   B. Ports
   C. Memory
   D. Control unit
11. Which of the following is NOT one of the three lines that control the memory call?
   A. Skew line page
   B. Address line
   C. Read write line
   D. Activation line
12. If the Memory address register is 8 bits wide, the number of possible memory address is
   A. 8
   B. 16
   C. 64
   D. 256
13. Memory that retains its values when power is removed is called
   A. DRAM
   B. SRAM
   C. Volatile
   D. Nonvolatile 非易失性的
14. There would never be a reason for an address transfer from the _____ to another register within the CPU
   A. IR
   B. PC
   C. MAR P203
   D. MDR
15. When the instruction being executed is to store data, the data will be transferred from another register in the CPU to the _____, and from there it will be transferred in to memory
   A. IR
   B. PC
   C. MAR
   D. MDR P203

16. The different ways of establishing memory address within an instruction are called
    A. MAR codes
    B. MDR codes
    C. Addressing modes P204
    D. Programmable modes
17. Flash Memory
    A. is volatile
    B. is faster than standard RAM
    C. has unlimited rewrite capacity
    D. is nonvolatile
18. The first step in the instruction cycle is
    A. clear the accumulator
    B. fetch the instruction from memory P207
    C. decode the instruction in the accumulator
    D. copy the data from the MAR to the MDR
19. The physical connections that make it possible to transfer data from one location in the computer system to another are called
    A. flags
    B. fibers
    C. buses
    D. peripherals
20. Optical conductions are
    A. faster than electrical conductors
    B. cheaper than electrical conductors
    C. more common than electrical conductors
    D. all of the above
21. A bus in which there is an individual line for each bit of data, address, and control is called a
    A. wide bus
    B. serial bus
    C. parallel bus
    D. dedicated bus
22. A bus that transfer data sequentially, one bit at a time using just a single line pair is called
    A. a serial bus
    B. a single bus
    C. a narrow bus
    D. a sequential bus
23. A bus line that is “one-way” is called
    A. a simplex bus line
    B. a serial bus line
    C. a one-way bus line
    D. a sequential bus line
24. A bus line that can carry data in both directions at the same time is called a
    A. simplex bus line
    B. complex bus line

C. full duplex bus line
D. half duplex bus line

25. The exposed connectors into which external cables can be plugged are often called
A. plugs
B. lines
C. ports
D. stacks

Chapter8

1. CPU architecture is defined by the basic characteristics and major feathers of the CPU “CPU architecture” is sometimes called
A. architecture design
B. structural organization
C. instruction set architecture P236
D. CPU design and organization
2. The _____ must be designed to assure that each step of the instruction cycle has time to complete before the results are required by the next step.
A. ALU
B. Clock cycle
C. Control Unit
D. Instruction pointer
3. The fetch unit portion of the CPU consists of an instruction fetch unit and an instruction _____ unit.
A. decode P242
B. translate
C. decipher
D. conversion
4. Overlapping instructors—so that more than one instruction is being worked on at a time—is known as the
A. conveyor belt method
B. pipelining method P243 流水线
C. assembly line method
D. accelerator method
5. Instruction reordering makes it possible to provide parallel pipelines, with duplicate CPU logic, so that multiple instructions can actually be executed
A. sequentially
B. consecutively
C. simultaneously P244
D. very fast in serial operation
6. There are a number of difficult technical issues that must be resolved to make it possible to execute multiple instructions simultaneously. One of the most important of these is
A. Instructions completing out of order P246
B. Instructions that have floating point operations
C. Instructions that can be serialized

D. Instructions that require the same number of CPU cycles complete

7. Out-of-order instruction execution can cause problems because a later instruction may depend on the results from an earlier instruction. This situation is known as a _____ or a _____
   A. risk, reliance
   B. hazard, reliance
   C. risk, dependency
   D. hazard, dependency
8. CPUs can actually search ahead for instructions without apparent dependencies, to keep the execution units busy. Current Intel x86 CPUs, can search _____ instruction ahead, if necessary, to find instructions available for execution.
   A. five to ten
   B. ten to twenty
   C. twenty to thirty P247
   D. fifty to one hundred
9. Branch instructions must always be processed ahead of subsequent instructions. Conditional branch instructions are more difficult than unconditional branches. These types of dependencies are known as control dependencies or sometimes as _____ or branch dependencies.
   A. flow P247
   B. decision
   C. qualified
   D. provisional
10. Some systems provide a small amount of dedicated memory built into the CPU that maintains a record of previous choices for each of several branch instructions that have been used in the program being executed to aid in determining whether a branch is likely to be taken. What are the contents of this memory called
    A. look-ahead table
    B. branch history table
    C. branch prediction table
    D. future speculation table
11. What are the slowest steps in the instruction fetch-execute cycle?
    A. Slowest steps are those that require memory access.
    B. Slowest steps involve incrementing the instruction pointer.
    C. Slowest steps are those that require special integer register access.
    D. Slowest steps are those that require floating point register access.
12. What is the major drawback of Dynamic RAM(DRAM)?
    A. cost
    B. capacity
    C. data loss
    D. memory latency (the access time of DRAM)
13. Which of the following is a commonly used approach for improving performance of memory?
    A. Doubling the capacity of memory
    B. Using DRAM instead of SDRAM

C. Compressing instructions and data in RAM

D. Widening the system bus between memory and the CPU

14. Each block of cache memory provides a small amount of storage, perhaps between 8 and 64 bytes, also known as

A. a cache hit

B. niche cache

C. a cache line P251

D. a small block cache

15. Cache memory hit ratios of _____ percent and above are common with just a small amount of cache.

A. 30

B. 60

C. 80

D. 90 P253

16. A part of main memory can be allocated to store several adjoining blocks of disk memory. If the required data is in _____ then no disk access is necessary

A. disk cache

B. cache blocks

C. read once cache

D. buffer disk cache

17. Instructions, fetched from memory, are _____ within the instruction unit, to determine the type of instruction that is being executed. This allows branch instructions to be passed quickly to the branch processing unit for analysis of future instruction flow

A. partially decoded

B. partially executed

C. completely decoded

D. completely executed

18. In a superscalar CPU, the instruction unit has a(n) _____ to hold instruction until the required type of execution unit is available

A. pipeline

B. assembly unit

C. instruction set

D. cache memory

19. Computers that have multiple CPUs within a single computer, sharing some or all of the system's memory and I/O facilities, are called _____, or sometimes tightly coupled systems.

A. bundled systems

B. simultaneous systems

C. multiprocessor system

D. compound processor systems

20. Under ideal conditions, each CPU processes its own assigned sequence of program instructions

A. independently of other CPUs

B. partially sharing the workload with other CPUs

C. without interrupting the other CPUs

D. by sharing L1 cache between other CPUs

21. Each CPU in the processor, within a single integrated chip, is called a _____

A. core

B. CPU unit

C. control unit

D. Independent Processor Chip(IPC)

22. What is a “thread”?

A. The same segment of code used by many programs.

B. Independent segments of programs available to be executed in parallel

C. The set of all variables that are used by all programs in execution.

D. Shared allocation of cache memory used by programs available to be executed

23. In Symmetrical Multiprocessing (SMP) each CPU has

A. identical access to memory

B. identical access to the I/O and memory

C. identical access to the operating system, I/O and memory

D. identical access to the operating system, and to all system resources, including memory

24. Simultaneous thread multiprocessing (STM) is also known as _____

A. hyperthreading

B. superthreading

C. expert threading

D. concurrent threading

Chapter9

1. An important difference between the I/O requirements of keyboards and disk drives that

A. A keyboard inputs is fast while disk drives are slow

B. Keyboard require constant monitoring while disk drives do not

C. Disk drive have I/O controllers and Keyboards do not have I/O controllers

D. Disk data is always transferred in blocks, never as individual bytes as with the keyboard P269

3. From the perspective of a computer, the network

A. Is just another I/O device

B. Requires and Ethernet connection

C. Is complex set of interconnected hosts

D. Is addressable only in blocks of 32 bits address

4. The method used to communicate events that need special attention to the CPU are known as

A. interrupts

B. I/O controllers

C. Programmed I/O

D. Device controllers

5. The method of transferring data one word at a time from the CPU to a device is called

A. Polling

B. Programmed I/O

C. Vectored interrupt

D. Direct memory access

6. Computers provide interrupt capability by providing one or more special control lines to the central processor known as

A. Fault line
B. Address lines
C. Interrupt lines
D. Instruction lines

7. The program that determines that appropriate course of action in the event an interrupt occurs is called that

A. Fault handler
B. Device handler
C. Interrupt handler
D. Instruction handler

8. When an interrupt causes temporary suspension of program in progress, all the pertinent information about the program being suspended, included the location of the last instruction executed, and the values of data in various registers are stored in an area of memory known as the

A. Register dump block
B. Memory dump block
C. Program method block
D. Process control block

10. Since many interrupts exist support I/O devices, most of the interrupt handling programs are also knowns as

A. Device drives
B. Device handlers
C. Peripheral handlers
D. Peripheral handlers

11. The method of continuously checking the various input devices to determine if input data is writing is called

A. Polling
B. Observing
C. Monitoring
D. superfine

13. Which of the following is an example of an interrupt being used as an external event notified?

A. A keyboard
B. A program inadvertently attempts to divide by zero
C. A time quantum has passed the CPU is interrupted to start another task
D. An application program requests service from the operating system using a software interrupt

14. External events like keyboard input, mouse clicks, printers ” out of paper” messages, and power failures are handled by

A. Interrupts
B. Devices handlers
C. Peripheral controllers

D. Suspension subprograms

15. The computer system provides an internal clock that send an interrupt periodically to the CPU signaling that it's time to start processing another program or thread. The time between interrupt pulses is known as a

A. Delta
B. Quantum
C. Unit quantity
D. atom quantity

16. Event related to program or special conditions with the computer system itself, like divide by zero, or attempting to execute a nonexistent op code, we called

A. irregular events
B. unusual events
C. abnormal events
D. anomalous events

17. Internal interrupts caused by events related to program or special conditions within the computer itself are sometimes called

A. exclusions
B. exemptions
C. special errors
D. trap or exceptions P281

18. Instructions that intended for use by an operating system program, but not by an application program, are called P281

A. control instructions
B. limits instructions
C. prevalent instructions
D. privileged instructions

29. Data from disks, and tapes, and flash memory are transferred only in

A. a bits
B. a chunks of data
C. blocks of data
D. characters or bytes data

30. Which of the following is not one of the three primary conditions for direct memory access to take places?

A. The I/O device must have an internal buffer
B. There must be a method connect together the I/O interface and memory
C. There must be a means to avoid conflict between the CPU and the I/O controller
D. The I/O controller associated with the particular device must capable reading and writing memory

31. Four pieces of data must be provided to the I/O controller for particular I/O device to initiate the DMA transfer. Which of the following is not required?

A. The size of the block to be transferred
B. The location of the data on the I/O device
C. The length of time required to transfer the data

32. The incompatibilities in speed between the various devices and the CPU make I/O synchronization difficult, especially if there are multiple devices attempting to do I/O at the same time. To handle these problems data is usually stored

A. In a buffer
B. On the network
C. On the disk drive
D. In external storage

33. I/O controllers that control a single type of device are often called

A. Device controllers
B. Precision controllers
C. Peripheral controllers
D. Single-type controllers

34. An I/O controller that is designed to control hard disks is called a P289

A. Disk handler
B. Disk controller
C. Disk coordinator
D. Disk interrupt handler

Chapter 10 Computer Peripherals

1) All components comprising a computer system except for the____, are considered peripherals.
a) CPU
b) CPU and memory
c) CPU, memory, and power source
d) CPU, memory, disk drives and power source

2) Storage not immediately available to the CPU is referred to as
a) cloud storage
b) off-line storage
c) network storage
d) secondary storage

4) In technical specifications for flash memory, the read/write block is called a
a) page
b) lump
c) chunk
d) paragraph

5) On a modern hard dish, what is the typical size of a block of data?
a) 64 bytes
b) 128 bytes
c) 512 bytes P300 512 or 4096

d) 1024 bytes

6) With the hard drive read/write head in a fixed position, it traces out a circle on the disk surface as the disk rotates; this circle is known as a
a) page
b) block
c) track
d) cluster

10) Once the hard-disk read/write head is located over the desired track, the read/write operation must wait for the disk to rotate to the beginning of the correct sector. This time is called
a) seek time
b) arrival time
c) transfer time
d) rotational latency time

11) The time required to transfer one block of data is called as the
a) seek time
b) arrival time
c) transfer time
d) rotational latency time

15) A mirrored array requires a minimum of ____ disk drives.
a) two
b) three
c) four
d) five

17) In terms of the ability to see detail in a display, a more interesting measure of resolution is the
a) pixel count
b) pixel density
c) pixel intensity
d) pixel concentration

18) Displays the us 256(Red)×256(Green) ×256(Blue) different colors on the screen is sometimes described as a
a) true color system
b) virtual color system
c) ultra high density system
d) high density color system

19) The number of bits used to represent colors in an image is known as

a) color depth
b) color length
c) color strength
d) color intensity
20) A proprietary standard, developed by Microsoft to render 2-D and 3-D objects is known as
a) OpenGL
b) DirectX
c) ActiveX
d) OpenSource

24) With the exception of the Cell Engine, current GPUs are generally based on maximizing the number of operations that can take place at the same time, or____
a) serialization
b) concurrency
c) parallelization
d) synchronization

25) One of the main disadvantages of active matrix LCDs is that they
a) consume a lot of power
b) have poor viewing angles
c) are expensive and difficult to manufacture
d) are lower quality than a passive matrix display

27) Which of the following printing technologies was derived from xerography?
a) LED printers
b) Laser printers
c) Ink-jet printers
d) Impact printers

28) Which of the following printing technologies boils ink in a nozzle to spray a tiny droplet onto the paper?
a) LED printers
b) Laser printers
c) Ink-jet printers
d) Impact printers

29) When a key is pressed on the keyboard, a binary code called a(n)____ is sent to the controller.
a) octal code
b) scan code
c) check code
d) ASCII code

30) What kind of data is represented by a bar code?
a) BCD

b) Numeric
c) Alphabetic
d) Alphanumeric

31) How does Quick Response software isolate the Quick Response(QR) code from other parts of an image?
a) QR software compares image to a list of known images.
b) QR software uses 2D mapping technology to read the QR code
c) QR software requires the image capture device be perpendicular to the QR code

Chapter 11 Modern Computer Systems

1) A technique called ____ is where an individual computer system is used to simulate multiple computers, all sharing the same CPU and I/O facilities.
a) clustering
b) replicating
c) virtualization
d) parallelization

2) In most computer systems, the CPU, memory, and other major components are mounted to wiring on a printed circuit board known as a(n)
a) circuit plane
b) motherboard
c) adapter board
d) peripheral board

4) Considering the computer system as a whole allows further advances in performance, which result from system integration. This is known as
a) utility
b) synergy 协同
c) harmony
d) integrated cooperative action

5) The circuitry that connects the CPU to memory and to all the various modules that control I/O device is called the
a) I/O bus
b) system bus
c) interconnect bus
d) communications bus

6) The CPU and memory are interconnected through a memory bridge sometimes called the
a) I/O Bridge
b) southbridge
c) northbridge

d) Interconnect Bridge

7) I/O is typically connected using various standard buses, such as SATA, Thunderbolt, and USB, though I/O controllers and PCI-Express buses to an I/O bridge, sometimes called the
a) I/O Bridge
b) southbridge
c) northbridge
d) Interconnect Bridge

8) The IEEE 1394 bus is sometimes referred to as
a) USB
b) Firewire
c) DisplayPort
d) Thunderbolt

9) USB-3 is capable of a full duplex data transfer rate up to ____ gigabits per second, which makes it suitable for use with a wide range of device.
a) .5
b) 1
c) 10
d) 100

11) DisplayPort was originally designed for
a) character-based video displays.
b) vector graphics displays
c) high resolution video displays
d) television attachment

12) SATA stands for Serial Advanced Technology Attachment; it replaces an older standard, IDE (Integrated Drive Electronics), and is used primarily as an interface for
a) printers
b) network communications
c) high resolution video displays
d) magnets and optical disk storage devices

14) The USB protocol allows packets to be scheduled for delivery at regular time intervals. This technique is known as
a) synchronous data transfer 同步
b) asynchronous data transfer 异步
c) isochronous data transfer 等时
d) bisynchronous data transfer 双同步

15) Thunderbolt is designed to support a data transfer rate of up to ____ gigabits per second in each direction through each of two channels, which is suitable for the transfer of full high

definition video with sound.
a) .5
b) 1
c) 10　　与 USB3.0 相同
d) 100

16) Thunderbolt connections can be made using either copper or fiber optic cable. The optic cable will work over distance of up to ____ meters.
a) 10
b) 50
c) 100
d) 1,000

17) A serial version of Small Computer System Interface is called
a) iSCSI
b) eSCSL
c) pSSCSL
d) EtherSCSL

18) The input-output architecture based on separate I/O processors and used on IBM mainframes is known as a(n)
a) SCSI subsystem
b) channel subsystem
c) subroutine subsystem
d) embedded I/O CPU subsystem

19) In the channel architecture, used on IBM mainframes, the I/O processor acts as a separate computer just for I/O operations, thus freeing the computer CPU for other tasks. This I/O processor has its own set of instructions known as____, and executes them independently of the CPU.
a) I/O control instruction
b) channel control words
c) interrupt control words
d) vector control instruction

20) The primary purpose of channel programs is to transfer data using DMA between
a) memory and CPU
b) memory and the NIC
c) memory and RAID arrays
d) an I/O device and memory

24) In a cluster of loosely coupled computers, each computer in the cluster is called a
a) hub
b) node

c) server
d) member

26) Which of the following is not a reason to create cluster of computers?
a) load balancing
b) fault tolerance
c) high availability
d) increased security

29) When clustering is used to connect computing systems, using shared disks, the workload can be divided by partitioning the data between the nodes so that work requests made of each node will be relatively independent and approximately equal. The primary difficulty with this configuration is that it is not always possible to plan for and predict accurately the
a) link latency
b) partitioning 分区
c) method of communication
d) errors in data communication

30) Beowulf cluster are simple, highly configurable clusters designed to provide high performance at low cost. Beowulf clusters consist of multiple computers connected together by a dedicated, private
a) VPN
b) Ethernet
c) Internet connection
d) fiber channel protocols

31) Blade servers are computers mounted on a board similar to a motherboard that can be plugged into connectors on a rack. A typical blade server has one or more
a) power supplies
b) display adapter
c) motherboard attached
d) dedicated hard drives

Chapter 12 Networks and Data Communications An Overview

1) The sender and receiver end points, in a communications system are referred to as
a) hosts
b) end-users
c) edge devices
d) interface devices

2) Since data communication is predominantly serial, we usually describe the data as a
a) bit flow.

b) bit surge.
c) byte flow.
d) byte stream.

3) To solve the related problems of channel availability and maximum utilization, there must be a way to break long messages into smaller units. These units are called
a) boxes.
b) packets.
c) envelopes.
d) containers.

5) A direct USB connection between a smartphone and a personal computer is an example of
a) multicast.
b) broadcast
c) one-to-many connection.
d) point-to-point connection.

6) The typical communication channel is actually divided into segments; connections along the segments are called
a) links.
b) routes.
c) dedicated paths.
d) transmission paths.

9) Some channel characteristics are determined innately by the medium. For example, unguided messaging must be carried by an analog signal known as a
a) shipping signal.
b) carrier signal.
c) delivery signal.
d) transport signal.

10) Channels that carry messages in only one direction are known as a
a) one-way channels.
b) simplex(单一) channels.
c) full duplex channels.
d) half-duplex channels.

11) Channels that carry messages in both directions, but only one direction at a time, are called
a) simplex channels.
b) one-way channels.
c) full-duplex channels.
d) half-duplex channels.

12) Channels that carry signals simultaneously in both directions are called

a) simplex channels.
b) one-way channels.
c) full-duplex channels.
d) half-duplex channels.

14) In a _____ topology each computer node gets every message, but processes only those addressed to that node. There is no central hub in this topology.
a) star
b) bus
c) ring 环状
d) mesh 网状

15) Which of the following topologies is used primarily for local area networks; all nodes are connected point-to-point to a central device that uses switching technology to connect pairs of nodes together?
a) star
b) bus
c) ring
d) mesh

16) Which of the following topologies consists of point-to-point connections from each node on the network to the next node; the last node on the network is connected back to the first and there is no central hub?
a) star
b) bus
c) ring
d) mesh

18) Which of topology defines the operational relationship between the various network components?
a) virtual
b) logical
c) physical
d) tangible

20) The most familiar, and often most practical and useful, way to categorize networks is by their
a) geographical range of service
b) medium used (coaxial cable, wireless, fiber)
c) standard specification number (802.3,802.11, X.25)
d) usage (Web server, database server, peer-to-peer, storage area network)

21)In a(n) _____ hub, all of the connections at the hub are simply tied together inside the hub and the hub performs no operation or modification of the signals as they arrive at the hub.
a) active

b) layer 3
c) passive
d) intelligent

23) Which Ethernet type is based logically on a star topology and when one node on the network wishes to communicate with another node, the switch sets up a direct connection between the two?
a) Star Ethernet
b) Ring Ethernet
c) Mesh Ethernet
d) Switched Ethernet

25) Which type of network is used to interconnect local area networks? The primary motivation for this type of network if to improve overall performance of a larger network by creating separate local area networks for group of users who communicate primarily with each other.
a) link networks
b) extended networks
c) connected networks
d) backbone networks 主干网

26) In a wireless network where the access points are connected by radio, the mesh points operate at the_____ and are essentially invisible to the upper layers of the network
a) physical layer (layer 1)
b) transport layer (layer 4)
c) session layer 5 (layer 5)
d) medium-access control layer (layer 2)

27) Operation of a metropolitan area network (MAN) generally requires
a) access servers.
b) peering agreements.
c) right of way access.
d) fiber optic transmission.

29) Which type of network is designed to facilitate communications between users and applications over large distances--between the various corporate offices of an international organization that are located in cities all over the world, for example.
a) LAN
b) WAN
c) CAN
d) MAN

30) Which type of network has ranges of only thirty feet or less, but is sufficient for an individual to interconnect his personal computing devices?
a) PAN

b) LAN
c) WAN
d) CAN

31) How might a LAN be designed in a business setting to minimize extraneous traffic where possible?
a) Create separate LANs for each floor.
b) Create separate LANs for each manager.
c) Create separate LANs for each department.
d) Create separate LANs for each district or territory.

33) Which of the following is **not** true about datagram switching?
a) TCP/IP rarely uses datagram switching.
b) Each packet is routed from node to node independently.
c) A routing decision can be based on shortest path to next node.
d) A routing decision can be based on traffic conditions at the time of packet arrival.

34) How do routers and gateways differ?
a) Routers are used in ISPs; gateways are used in WANs.
b) There are no differences between routers and gateways.
c) Routers interconnect dissimilar networks together; gateways connect similar networks.
d) Routers connect similar networks together; gateways interconnect dissimilar networks.

Chapter 13: Ethernet and TCP/IP Networking

1)The TCP/IP and OSI models are conceived and implemented as a hierarchical_____, in which each layer at the sending node contributes information that will be used by the corresponding peer layer at the receiving node.
a) rank structure
b) protocol stack
c) proprietary stack
d) communication levels

2) Which of the following is not part of the TCP/IP protocol suite?
a) http
b) ftp
c) SMS
d) ssh

3)A data packet in an Ethernet network is called a(n)
a) pack.
b) frame.

c) envelope.
d) container.

8) The amount of time that it takes for a packet to get from one end of the network to the other is called the
a) furthest node travel time.
b) network broadcast delay.
c) network propagation delay.
d) network diameter delay time.

9) The _____ is responsible for the addressing and routing of packets from the source end node through intermediate nodes, step by step, to their proper final destination.
a) transport
b) network layer
c) physical layer
d) Data Link Layer

12) Such network tools as ping and traceroute use the query services of _____ to provide the information that they report.
a) ARP
b) FTP
c) ICMP
d) HTTP

13) The purpose of the _____ layer is to take messages from network applications and provide services that support reliable end-to-end communications.
a) network
b) physical
c) transport
d) Data Link

14) To identify the network application requesting service, the transport protocol identifies the application that created the message and the application that is to receive the message with
a) port numbers.
b) application numbers.
c) network node numbers.
d) application address numbers.

15) For communication between an application and the transport layer, operating systems provide an interface called a(n) _____, which makes it easy to add a request to the communication services provided by the TCP/IP suite.
a) socket
b) named interface
c) TCP/IP association

d) service association

17) A connectionless protocol used instead of TCP for some applications is
a) user packet protocol.
b) user segment protocol.
c) user fragment protocol.
d) user datagram protocol.

18) An alternative to configuring individual workstations is to establish configurations dynamically when the computers connect to the network. What is this approach called?
a) NAT
b) DHCP
c) Masking
d) Dynamic NAT (DNAT)

20) Since DNS request packets are simple and small, _____ are used for packet transport.
a) IP packets
b) TCP packets
c) UDP datagrams
d) Ethernet frames

22)In part, _____ focuses on methods to reserve and prioritize channel capacity to favor packets that require special treatment.
a) DNS
b) QoS
c) TCP/IP
d) Ethernet

24) Modem routers, sometimes called _____, can prioritize and route packets based on the packet class.
a) QoS routers
b) Edge routers
c) Gateway routers
d) DiffServ capable nodes

25) Which of the following is a primary measure to keep the network and system resources intact and free from the results of intrusion?
a) CAPTCHAs
b) confidentiality
c) electronic signatures
d) limiting physical access to network wiring and network equipment.

27) Protecting the content of data communication against changes is known as
a) integrity.

b) encryption.
c) confidentiality.
d) authentication.

28) Using encryption can be helpful in mitigating network security issues except
a) intrusion.
b) availability.
c) authentication.
d) nonrepudiation.

30) Symmetric key cryptography requires
a) two different keys, both private.
b) the same key be used for both encryption and decryption.
c) two different keys, one publicly available, and the other private.
d) the same key be used, one publicly available, and the other private.

31)The upper_____ layers of the OSI model assume that a successful end-to-end connection is established and maintained at the transport layer. These layers are concerned with the flow of data and control between applications on the communicating nodes. ，
a) two
b) three
c) four
d) five

32) The dialogue between two cooperating applications or processes at the ends of the communication link on the OSI model is known as a
a) session.
b) connection.
c) communications link.
d) time-sensitive service.

35) MPLS operates at the _____ layer.
a) network
b) data link
c) transport
d) application

Chapter 14 Communication Channel Technology

1) Which of the following can be used to characterize a communications channel?
a) Noise
b) Jitter

c) Bit rate capacity
d) All of the above

2) transmission has the advantage that it can incorporate error correction directly into the signal, which means a higher likelihood that the original data can be reproduced exactly, error-free, at the receiving end of the channel.
a) Analog
b) Digital
c) Point-to-point
d) Shared channel

3) It is possible to share a channel among multiple sender-receiver pairs, using one of several _____ techniques.
a) analog
b) digital
c) multiplexing
d) point-to-point

4) A signal may take on a continuous range of values, in which case it is known as a(n)
a) digital signal.
b) analog signal
c) discrete signal
d) none of the above.

5) A binary discrete signal is usually called a(n)
a) digital signal.
b) analog signal
c) discrete signal.
d) none of the above.

6) Sound is an example of a(n) _____ signal.
a) analog
b) digital
c) discrete
d) multiplexed

7) The electromagnetic waves used for radio transmission are _____ signals.
a) analog
b) digital
c) discrete
d) multiplexed

8) Which of the following is NOT a characteristic of a sine wave?
a) Noise
b) Period
c) Amplitude
d) Frequency

9)Hertz, abbreviated Hz, is the unit used to measure
a) noise
b) velocity
c) amplitude
d) frequency

10)What is the physical distance over which the wave's shape repeats for a sine wave that is traveling in space at the speed of light?
a) (amplitude) x (frequency).
b) (amplitude) / (frequency).
c) (speed of light) x (frequency).
d) (speed of light) / (frequency).

11) It is possible to measure the position of a sine wave with respect to a reference sine wave. The difference, measured in degrees, is known as the of the _____ of the sine wave.
a) phase
b) amplitude
c) frequency
d) wavelength

12) The _____ of a channel is the range of frequencies that are passed by the channel with only a small amount of attenuation.
a) noise
b) range
c) spectrum
d) bandwidth

13) Sound waves audible to humans occupy frequencies between approximately:
a) 20-Hz and 20,000Hz.
b) 200-Hz and 30,000 Hz.
c) 2,000-Hz and 30,000 Hz.
d) 2,000-Hz and 120,000 Hz.

14) An AM radio station that broadcasts at 1100 KHz means the _____ frequency is 1100 KHz.
a) multiplexing
b) analog
c) carrier
d) digital

15) An important characteristic of sine waves is that mathematic all waveforms， regardless of shape, both analog and digital, can be represented as the_____ of sine waves of different frequencies, phases, and amplitudes.

a) sum

b) cube

c) product

d) square-root

16) Both wired and wireless analog signals are particularly susceptible to noise and attenuation and other forms of distortion in a channel because the distortion created cannot be

a) detected.

b) reversed.

c) amplified.

d) detected and reversed.

17) By modulating different data signals with different carrier frequencies, it is possible to carry multiple signals simultaneously on the same channel, if the overall channel bandwidth is wide enough to include the spectra for each signal. This technique is called

a) time division multiplexing (TDM).

b) spectrum division multiplexing (SDM).

c) amplitude division multiplexing (ADM).

d) frequency division multiplexing (FDM).

18) Optical multiplexing is known as

a) time division multiplexing (TDM).

b) spectrum division multiplexing (SDM).

c) amplitude division multiplexing (ADM).

d) wavelength division multiplexing (WDM).

19) Signal loss is the reduction of a signal that occurs in a medium as a function of the physical length of the channel, this is known as

a) degradation.

b) attenuation.

c) frequency degradation.

d) amplitude degradation.

20) For modems that transmit data one byte at a time the technique to synchronize the two systems is to provide clear start and stop signals for the data.

This technique is known as _____ transmission.

a) byte code

b) synchronous

c) block coding

d) asynchronous

21) _____ adds additional bits to small blocks of data, it then converts each block to a different block of data that supplies the required self-clocking.
a) Byte coding
b) Sector coding
c) Block coding
d) Manchester encoding

22) There must be a means to synchronize the data so that the receiver knows the boundaries of each byte. Ethernet frames use a(n) _____ for this purpose.
a) start bit
b) preamble 报头
c) external clock
d) timing channel

23) When converting from analog to digital form, an A-to-D converter samples the wave at regular intervals and stores the sample as a binary value.
The result is a digital representation of an analog wave. This process is called
a) signal code modulation (SCM).
b) pulse code modulation (PCM). P485
c) analog code modulation (ACM).
d) digital code modulation (DCM).

24) What specific device is used to retransmit digital signals over long distances maintaining the integrity of the data?
a) Routers
b) Switches
c) Repeaters
d) Amplifiers

25) Which of the following multiplexing techniques is normally used with digital signals?
a) Time division multiplexing (TDM)
b) Frequency division multiplexing (FDM)
c) Amplitude division multiplexing (ADM)
d) Phase division multiplexing (PDM)

26) Transmission media that confine the signal physically to a cable of some kind are called
a) guided media.
b) channel media.
c) confined media.
d) unguided media.

27) _____ is the most common medium used for standard telephone and most local area network wiring.
a) Cable
b) Coaxial
c) Twisted pair
d) Untwisted pair

28) Analog cable TV carries dozens of channel over a single cable using
a) time division multiplexing
b) frequency modulation
c) amplitude modulation
d) frequency division multiplexing

29) Which of the following is FALSE regarding fiber-optic cabling?
a) Attenuation is very low.
b) It is vulnerable to most forms of noise.
c) A laser or light-emitting diode is used as the light source.
d) Each strand is thinner than a human hair and may be tens or hundreds of miles long.

30) What is a common name for one Wireless Ethernet standard?
a) Wi-Fi
b) WiMAX
c) Radio Ethernet
d) Frequency Ethernet

31) For ranges longer than local area networking, the two contending standards are WiMAX and _____ technology.
a) Wi-Fi
b) Fast Ethernet
c) Radio Ethernet
d) cellular telephone

32) Which of the following is a contender for a cellular technology global standard?
a) 3G
b) WiFi
c) Mobile Ethernet
d) Long Term Evolution (LTE)

33) A Bluetooth network consists of one master node and to seven slave nodes. When connecting, the master node transmits an initial packet, called a_____, that provides time synchronization for each slave.
a) block
b) frame P493
c) sequence

d) large data packet

35) When successive frames are transmitted on different channels, assigned randomly by the master node (as in a Bluetooth device), the technique is called
a) spectrum synchronizing.
b) frequency-hopping spread spectrum.
c) quadrature amplitude modulation (QAM).
d) orthogonal frequency-division multiplexing (OFDM).

Chapter 15 Operating System: An Overview

1) Which of the following use computer-based operating systems?
a) Mobile phones
b) Business systems
c) E-readers md notebooks
d) All of the above

2) What role does the operating system play between the user and the user's programs and the hardware of the computer?
a) Slave
b) Adversary
c) Intermediary
d) Commander in Chief

3) Which of the following is a basic service that the operating system provides?
a) Manages, loads, and executes programs
b) Accepts and processes commands from user
c) Manages the hardware resources of the computer
d) All of the above

4) Modem computer systems enable users to work with more than one program at the same time as a way to improve their efficiency. This technique is known as
a) multitasking.
b) multi-methods.
c) multiprocessing.
d) multi-procedures.

5) What process or technique provides the means for starting the computer?
a) Concurrency
b) Initial Program Loader
c) User provided programs
d) Programs already stored m RAM

6) The critical components of the operating that remain in memory as long as the computer is

running are commonly known as the
a) hub.
b) root.
c) core.
d) kernel.

7) Diskless workstations are also known as
a) thin clients.
b) slim clients.
c) lean clients.
d) trusted clients.

8) Large-scale billing, payroll, and other similarly data intensive systems usually use _____ processing systems.
a) batch
b) embedded
c) interactive
d) conversational

9) The operating system has to respond to many different types of events. Which of the following is considered an event?
a) File requests
b) I/O interrupts
c) Memory requests from programs
d) All of the above

10) Most modem operating systems provide some capability for combining computer commands into pseudo-programs, commonly called
a) API scripts.
b) shell scripts.
c) power scripts.
d) internal scripts.

11) Programs executed from a command line can combine commands using a technique called _____, so that the output from one command is automatically used as the input for another.
a) piping
b) chaining
c) channeling
d) parameter passing

12) Which operating system function is responsible for providing a consistent view of files across different I/O devices?
a) Memory management
b) The file management system

c) The input/output control system
d) Network management, communication support, and communication interfaces

13) Which operating system function is responsible for supporting plug-and-play devices?
a) Memory management
b) The file management system
c) The input/output control system
d) Network management, communication support, and communication interfaces

14) Which operating system function is responsible for deallocating a program's memory when it has completed execution?
a) Memory management
b) The file management system
c) The input/output control system
d) Network management, communication support, and communication interfaces

15) Which operating system function is responsible for managing virtual storage?
a) Memory management
b) The file management system
c) The input/output control system
d) Network management, communication support, and communication interfaces

16) Which operating system function is responsible for providing the communication software necessary to implement the features and facilities of Wi-Fi, wired Ethernet, and TCP/IP?
a) Memory management
b) The file management system
c) The input/output control system
d) Network management, communication support, and communication interface

17) Which operating system function is responsible for determining which jobs will be admitted to the system and in what order?
a) Scheduling and dispatching
b) Secondary storage management
c) Support for system administration
d) System protection management and security

18) Which operating system function optimizes the completion of I/O tasks by using algorithms that may reorder the requests for efficient disk access?
a) Scheduling and dispatching
b) Secondary storage management
c) Support for system administration
d) System protection management and security

19) Which operating system function limits the execution of a process to a sandbox?
a) Scheduling and dispatching
b) Secondary storage management
c) Support for system administration
d) System protection management and security

20) Which operating system function manages system configuration and setting group configuration policies?
a) Scheduling and dispatching
b) Secondary storage management
c) Support for system administration
d) System protection management and security

21) What technique is used to assure the currency and integrity of files when system failures occur during file changes?
a) Threading
b) Journaling
c) Virtual storage
d) Fail-over scripting

22) A process can be broken down into smaller units called
a) jobs.
b) pages.
c) threads.
d) execution units.

23) The CPU may be switched rapidly between different programs, executing several instructions from each, using a periodic dock-generated interrupt. What is that technique called?
a) threading
b) time-slicing
c) execution switching
d) nonpreemptive switching

24) Which of the following is the responsibility of the system administrator?
a) Recovering lost data
b) Adding and deleting users
c) Managing, maintaining, and upgrading networks
d) All the above

25) GUI and CLI are examples of
a) APIs
b) user interfaces
c) network service
d) dispatch algorithms

Chapter 16 The User View of Operating Systems

1) A _____ program is an outer layer software component that allows the user to interface with various operating system functions and services.
a) shell
b) kernel
c) tool bar
d) task menu

2) What is the benefit to having the user interface integrated into the operating system?
a) Power users prefer the added flexibility
b) Users have more control over the interface
c) User services are more powerful when integrated into the operating system
d) Improves standardization, consistency, and improves integration of services

3) What is the benefit of having user interfaces act and behave the same way?
a) Reduces the users' learning curve
b) Easier for users to write their own apps
c) Users have direct access to the hardware
d) All of the above

4) Which of the following is a how users commonly gain access to operating system services?
a) XML
b) HTML
c) CLI or GUI
d) Java programming language

5) Command languages are also referred to as
a) APIs.
b) procedures.
c) scripting languages. P539
d) all of the above.

6) Which of the following is not a common command language capability?
a) Passing arguments
b) Prompted user input
c) Direct memory access
d) Branching and looping

7) Some systems hide the user interface and use a _____ model to serve as the interface for applications.
a) CLI
b) GUI

c) Web browser
d) Powershell Window

8) While executing programs from the command line, most operating systems also allow the user to specify one or more _____ that can be passed to the program as arguments.
a) operands P540
b) instructions
c) application variables
d) execution parameters

9) Which user service is responsible for handling the physical manipulation of the files and to translate between logical and physical file representations?
a) File Management System
b) Disk and other I/O Device
c) Security and Data Integrity Protection
d) System Status Information and User Administration

10) Which user service is responsible for handling ACLs for program and data files?
a) File Management System
b) Disk and other I/O Device
c) Security and Data Integrity Protection
d) System Status Information and User Administration

11) Which of the following is a service provided by System Status and User Administration?
a) Who is logged into the system
b) Amount of available disk space
c) Percent of time that the CPU is busy
d) All of the above

12) In most systems, the API consists of a library of _____ that may be called by a program.
a) commands
b) path variables
c) batch programs
d) service functions

13) Which user service is responsible for determining the amount of available disk space, the amount of available memory, and the number of users on the system?
a) File Management System
b) Disk and other I/O Device Services
c) Security and Data Integrity Protection
d) System Status Information and User Administration

14) Which user service is responsible for mounting and unmounting devices?

a) File Management System
b) Disk and other I/O Device Services
c) Security and Data Integrity Protection
d) System Status Information and User Administration

15) Which user service is responsible for loading and execution of programs?
a) Program Execution P540
b) File Management System
c) Disk and other I/O Device Services
d) System Status Information and User Administration

16) Which user service is responsible for associating data files with a particular application?
a) Program Execution P541
b) File Management System
c) Disk and other I/O Device Services
d) System Status Information and User Administration

17) Which user service is responsible for organizing files and folders in a meaningful way?
a) Program Execution
b) File Management System
c) Disk and other I/O Device Services
d) System Status Information and User Administration

18) Which user service allows the user to change the user's password?
a) Program Execution
b) File Management System
c) Security and Data Integrity Protection
d) System Status Information and User Administration

19) Which user service provides means for multiple users to share data files and programs?
a) File Management System
b) Security and Data Integrity Protection
c) System Status Information and User Administration
d) Interuser Communication and Data Sharing Operations P543

20) Which user service makes it possible for multiple users to access the same data in a way that the integrity of the data is protected?
a) File Management System
b) Security and Data Integrity Protection
c) System Status Information and User Administration
d) Interuser Communication and Data Sharing Operations P543
21) To use the program service routines, the user's program makes requests to the operating system through the
a) file argument.

b) interrupt library.
c) command prompt.
d) application programming interface (API). P545

22) The _____ command is used to take the output from one program and use it as the input to another.
a) OUT
b) PUT
c) PIPE
d) XCOPY

23) When using the command line interface, most operating systems maintain an internal list of where most commands can be found, so there is usually no need to type the
a) API.
b) file location.
c) command file path. P546
d) command list.

24) Keyword operands are sometimes known as
a) switches.
b) mutations.
c) amendments.
d) command list parameters.

25) When using the command line interface, both Linux and Windows use the _____ symbol as a "wild card" for single character.
a) slash "/"
b) caret "^"
c) asterisk "*"
d) question mark "?"

26) Which type of program is well suited for routine transaction processing applications, such as credit card billing and payroll?
a) Batch programs
b) Network programs
c) Compiler programs
d) Interactive programs

Chapter 17 File Management

1) A _____ consists of binary data, where the bytes of data in the file represent the sequence of instructions that make up a program. The file is loaded sequentially into succeeding locations in memory for execution.
a) data file

b) ASCII file
c) program file P572
d) directory file

2) What type of data file consists of a mixture of alphanumeric ASCII characters and special binary formatting codes that are used in a word processor or spreadsheet?
a) Text P572
b) Video
c) Database
d) Numerical input

4) What type of data file consists of information about other files?
a) Video
b) Database
c) Directory P572
d) Source code

6) Data files whose records are always retrieved in sequence from the beginning of the file are known as
a) serial files
b) logical files
c) sequential files P574
d) random access files

7) Some applications require that records be retrievable from anywhere in the file in an arbitrary sequence. These files are known as _____.
a) serial files
b) logical files
c) sequential files
d) random access files P574

12) If the allocation unit size if too small,
a) file access is slower. P575
b) there is less overhead to track each allocation unit.
c) there is more unused space it the end of most allocation units.
d) All of the above

13) Most user commands to the operating system are actually requests to the _____ manager.
a) I/O
b) file
c) memory
d) processor

14) Which of the following are functions that are performed by a program rather than by a user?

a) Open a file and create a file pointer
b) Read a number of bytes from a file
c) Move the file pointer a number of bytes a distance forward or backward
d) All of the above P579

15) Which of the following is NOT an example of a record-based file operation?
a) Rename a file P579
b) Add a record to a file
c) Read (retrieve) a record
d) Delete a record from a file

16) Which of the following is an example of a file operation that manipulates the file directory, rather than the file itself?
a) Delete a file
b) Rename a file
c) Append one file to another
d) All of the above

18) When new I/O devices are added, or the device is changed, it is necessary only to replace the
a) configuration file.
b) I/O driver for that device. P581
c) File Management System.
d) shell program responsible for that device.

19) Files that are accessed _____ represent the great majority of all files.
a) randomly
b) as records
c) in parallel
d) sequentially P581

23) The use of noncontiguous space requires that the file system maintain a detailed, ordered list of assigned blocks for each file in the system. One method of maintaining the lists of blocks allocated to each file is to use the block numbers stored as a linked list, using pointers from one block to the next. This method is known as a(n)
a) joined blocking.
b) linked allocation. P585
c) connected blocking.
d) associated allocation.

26) Many systems provide a means for dividing physical devices, particularly disks, into independent sections called
a) disks.
b) RAIDs.
c) partitions. P593

d) Storage Pools.

27) The file system must maintain a directory structure for each device. In most cases, the directory for each device is stored on the device itself. In many computer systems, each file system is called a
a) disk.
b) volume. P594
c) directory.
d) partition.

28) The UNIX system does not attempt to avoid cycles. Instead, it restricts access to the linking capability of the system. Normal users may only create hard links to files, but not to _____. This prevents normal users from inadvertently creating cycles.
a) files in use
b) directories P602
c) root folders
d) working folders

30) An alternative to the client-server based approaches to file access in an enterprise is to have storage devices located together in a separate network that is accessible from all servers. This method is known as
a) disk networking.
b) fabric area storage.
c) storage area network. P605
d) multi-storage networking.

31) Which is NOT true about Access Control Lists (ACL)?
a) ACLs are not very granular
b) Storage space is needed for the ACL P606
c) ACLs are an ideal file protection service P605
d) Mechanisms are needed to check the ACL whenever a file is accessed P606

32) In contrast to ACLs, a file system can define three groups: an owner, a group associated with the file, and a universe that consists of everyone else. These groups are then assigned read, write, and _____ privileges.
a) open
b) share
c) print
d) execute P604

35) What is the main disadvantage of having automated file recovery procedures in the event of a disk crash or system failure during file access operations?

a) Performance is degraded. P607 Journaling file system
b) Operating system is more complex.
c) Only the metadata is guaranteed to be recovered
d) System administrators have to configure the log files.

Chapter 18 The Internal Operating System

1) In the hierarchical view of the operating system, the inner layers are designed primarily to manage the _____ resource of the computer and its interactions with computers.
a) I/O
b) file
c) users
d) hardware and software

2) To increase security, the critical parts of the operating system will execute in a protected mode while other programs will execute in _____ mode.
a) user
b) global
c) shared
d) isolated

5) A_____ is defined to include a program, together with all the resources that are associated with that program as it is executed.
a) method
b) process P621
c) procedure
d) discrete procedure

6) Processes that do not need to interact with any other processes are known as
a) parallel processes.
b) concurrent processes.
c) cooperating processes.
d) independent processes. P622

7) Processes that work together are known as
a) parallel processes.
b) concurrent processes.
c) cooperating processes.
d) independent processes.

14) As a way to optimize system performance, the CPU scheduling task is separated into two different phases. Which CPU scheduler phase is responsible for admitting processes to the system, providing long-term scheduling?
a) Phase II

b) Optimizer
c) Dispatcher
d) High-level scheduler

15) As a way to optimize system performance, the CPU scheduling task is separated into two different phases. Which CPU scheduler provides short-term scheduling, specifically, the instant-by-instant decision as to which process should be given CPU execution time?
a) Phase I
b) Optimizer
c) Dispatcher
d) High-level scheduler

17) Which of the following System Dispatching Objectives is concerned with completing each process as quickly as possible?
a) Ensure fairness
b) Maximize throughout
c) Minimize response time P630
d) Promote graceful degradation

18) _____ is a situation that occurs when a process is never given the CPU time that it needs to execute.
a) Deadlock
b) Starvation
c) Finite postponement
d) Indefinite turnaround time

19) Which of the System Dispatching Objectives does the algorithm first-in, first-out (FIFO) satisfy?
a) Prevent starvation P631
b) Maximize throughout
o) Maximize CPU utilization
d) Maximize resource allocation

21) When memory is partitioned into fixed spaces, _____ fragmentation is likely to occur.
a) outer
b) central
c) internal P635
d) external

22) The solution to the problems inherent with fixed partition and variable partition memory management schemes are found in
a) virtual memory. P636
b) virtual programming
c) using smaller OS kernels

d) larger hard drive capacity.

25) In a virtual storage system for each program, the operating system creates a _____, which keeps track of the corresponding frame location in physical memory where each page is stored.
a) page table P639
b) frame table
c) address table
d) memory map

26) What happens when an instruction or data reference is on a page that does not have a corresponding frame in memory?
a) An error occurs.
b) A page fault occurs. P643
c) The swap space is updated.
d) The referenced page it pulled out of memory.

28) The _____ algorithm replaces the page that has not been used for the longest time, on the assumption that the page probably not be needed again.
a) first-in, first-out (FIFO)
b) not used recently (NUR)
c) least recently used (LRU) P647
d) Second Chance Page replacement

32) Application program interface allow a program to access network services. Some network operating systems also provide access to services on remote machines that might not be available locally. These services are called
a) server-client calls (SCCs).
b) object procedure calls (OPCs).
c) remote procedure calls (RPCs)
d) network method calls (NMCs)