**Chapter 1**

1) The architecture of the computer system rests on a solid foundation that has changed only slightly and gradually since the \_\_\_\_\_.

a) late 1930s

b) late 1940s

c) late 1950s

d) late 1960s

2) The work performed by an individual computer system within the IT system can be characterized by

a) hardware and software

b) input, storage and output

c) storage processing and output

d) input, processing and output

3) As a matter of necessity, network interfaces must conform to standard agreement, known as \_\_\_\_\_, for messages to be understood by both computers during a message exchange between a pair of computers.

a) protocols

b) I/O services

c) device controllers

d) Ethernet standards

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

a) and application programs.

b) and operating system software.

c) application software and operating system software.

d) application software, file storage, and data processing.

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.

a) data

b) network

c) computer hardware

d) computer software

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

a) The data type must be numeric.

b) The data must be represented in binary form.

c) The data type must be alphanumeric, graphic, sound or color.

d) The size of the data must be smaller than the capacity of the hard drive.

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

a) ALU

b) Control Unit

c) Interface Unit

d) Main memory

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

a) data.

b) program instructions.

c) program instructions and data.

d) program instructions, data, and instructions for booting the computer.

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

a) processing concept.

b) stored program concept.

c) data-instruction concept.

d) memory-data-instruction concept.

10) Many of the internal OS services are provided by the \_\_\_\_\_ module, which contains the most important operating system processing functions.

a) CPU

b) root

c) kernel

d) central

11) The operating system’s \_\_\_\_\_ acts as an interface for application programs and utilities to access the internal services provided by the operating system.

a) monitoring system

b) supervising system

c) application subsystem

d) application program interface

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

a) RAM

b) ROM

c) hard drive

d) virtual memory

13) The fact that different types of computers can work together, share files, and communicate successfully is known as

a) supercomputing

b) open computing

c) distributed computing

d) coupled systems computing

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

a) logical

b) notional

c) tangible

d) theoretical

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

a) Manuals

b) Standards

c) References

d) Operating procedures

16) Unicode is a(n)

a) character encoding standard

b) video encoding standard

c) audio encoding standard

d) graphic encoding standard

17) MPEG-4 is a(n)

a) text standard

b) video standard

c) audio standard

d) graphic standard

18) MP3 is a(n)

a) text standard

b) video standard

c) audio standard

d) graphic standard

19) Which of the following is not a feature defined in a protocol specification for communication?

a) message format

b) data representation

c) Operating System vendor

d) identification and authentication

20) Storage devices communicate with a computer using protocols. One such protocol is:

a) SATA

b) PATA

c) serial encoded messages (SEM)

d) hard-disk parallel communications protocol (HDPC)

**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

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) interfaces

b) subsystems

c) the environment

d) super systems

4) The division of a system or subsystem into its components and linkages 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) system interconnections

c) linkages 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

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

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

d) 2013

2) How many bytes does it take to store the binary equivalent of the decimal number 1945?

a) 1

b) 2

c) 4

d) 10

3) The largest number that can be represented 8 bits without considering a sign is

a) 15

b) 255

c) 65,535

d) 10,000,000

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 101100112 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: *bn* 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 128 is equivalent to the decimal number

a) 9

b) 10

c) 24

d) 12

12) The hexadecimal number 1A16 is equivalent to the decimal number

a) 9

b) 17

c) 26

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) 12<18

b) 102<18

c) 1012<108

d) 1012<58

20) Which of the following is true?

a) 0.12>0.18

b) 0.12=0.18

c) 0.12<0.18

d) None of these

21) The number of different digits, including zero, that exist in the number system is the \_\_\_\_\_.

a) field

b) base

c) parameter

d) range

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

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

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

29) The binary number 10.012 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

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

5) The alphanumeric code that has codes for the characters of nearly every character-based alphabetic of the world is

a) ASCII.

b) Unicode.

c) Ordinal.

d) EBCDIC.

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 between the computer and an I/0 device are called

a) glyphs.

b) symbols.

c) control characters.

d) command characters.

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) raster scan.

d) collating sequence.

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 the 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 of 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 systems 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 assumption 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 factors: 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 instructions?

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

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

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

22) To correct for carries and borrows that occur when large numbers must be separated into parts to perform additions and subtractions, we use

a) a bit hold.

b) a carry flag.

c) an error flag.

d) an overflow flag.

23) What is the number 12.345\*102 without using exponential notation?

a) 0.12345

b) 123.45

c) 1234.5

d) 12345

24) In excess-50 notation, an exponent can range from

a) 0 to 50

b) -50 to 49

c) -49 to 50

d) -99 to 99

25) In excess-50 notation, an exponent equaling 17 is stored as

a) -37

b) 17

c) 67

d) 87

26) Shifting numbers left and increasing the exponent until leading zeros are eliminated is called

a) conversion.

b) factorization.

c) normalization.

d) excess notations.

27) The leftmost bit in an IEEE standard floating-point number represents

a) the exponent.

b) the mantissa.

c) the sign of the mantissa.

d) the sign of the exponent.

28) The exponent of a floating-point number is stored using

a) excess N notation.

b) one’s complement.

c) two’s complement.

d) binary coded decimal.

29) In the IEEE 754 standard 32 bit single-precision floating point format, how many bits are allocated to the exponent?

a) 1

b) 2

c) 7

d) 8

30) In the IEEE 754 standard 32 bit single-precision floating point format, how many bits are allocated to the mantissa?

a) 8

b) 16

c) 23

d) 24

**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.

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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).

Mailbox Contents

00 505

01 106

02 507

03 902

04 000

05 1 DAT

06 3 DAT

07 6 DAT

21) What is the value in the calculator after the first instruction (505) is completed?

a) 1

b) 2

c) 3

d) 6

22) What is the value in the program counter (instruction location counter) after the first instruction (505) is complete

d?

a) 01

b) 02

c) 03

d) 04

23) What is the value in the calculator after the fetch but before the execute portion of second instruction (106)?

a) 1

b) 2

c) 3

d) 6

24) What is the value in the calculator after the second (106) instruction is completed?

a) 1

b) 2

c) 3

d) 4

25) What is the value in the calculator after the third instruction (507) is completed?

a) 1

b) 2

c) 3

d) 6

26) What is the value in the calculator when the program is finished, i.e., when the halt instruction has been executed?

a) 1

b) 2

c) 3

d) 6

Mailbox Contents

00 602

01 106

02 507

03 206

04 902

05 000

06 1 DAT

07 3 DAT

08 6 DAT

27) What is the value in the calculator after the first instruction (602) is completed?

a) 1

b) 2

c) 3

d) unknown

28) What is the value in the program counter (instruction location counter) after the first instruction (602) is completed?

a) 01

b) 02

c) 03

d) 06

29) What is the value in the calculator after the instruction 507 is completed?

a) 1

b) 2

c) 3

d) 6

30) What instruction is never executed?

a) 602

b) 106

c) 507

d) 902

31) What data (DAT) value is never used?

a) 1

b) 2

c) 3

d) 6

32) What is the value in the program counter (instruction location counter) when the program is finished?

a) 03

b) 04

c) 05

d) 06

33) What is the value in the calculator when the program is finished?

a) 1

b) 2

c) 3

d) 6

34) In the von Neumann architecture, memory holds

a) data only.

b) instructions only.

c) data and instructions.

d) neither data and instructions.

35) In the von Neumann architecture, memory is addressed

a) by location number.

b) by the value stored.

c) by contents of the memory location.

d) None of the above.

**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 cell?

a) Skew line

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.

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

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 into memory.

a) IR

b) PC

c) MAR

d) MDR

16) The different ways of establishing memory address within an instruction are called

a) MAR codes.

b) MDR codes.

c) Addressing modes.

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.

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.

26) A bus that carries signals from a single specific source to a single specific destination is a(n)

a) simplex bus.

b) broadcast bus.

c) Ethernet bus.

d) point-to-point bus.

27) Virtually every bus internal to the CPU is

a) serial.

b) cables.

c) optical.

d) parallel.

28) Instructions that only the operating system can execute are called

a) system instructions.

b) executive instructions.

c) privileged instructions.

d) administrative instructions.

29) Programs that execute without privileges are said to execute

a) in user space.

b) in data mode.

c) in kernel space.

d) in privilege space.

30) Multimedia applications, like modifying an image, often use

a) PSW instructions.

b) Flash instructions.

c) MMD instructions.

d) SIMD instructions.

31) The sources and destinations of data for an instruction are known as

a) Op codes.

b) Operands.

c) Op registers.

d) Operation fields.

32) Increasing the number of bits available for the op code in an instruction word

a) increases the demand on the CPU.

b) increases the number of memory locations that can be addressed.

c) increases the number of instructions available in the instruction set.

d) has no impact on any of the above.

**Chapter 8 CPU and Memory Design Enhancement and Implementation**

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

d) CPU design and organization

2) The use of fixed-length, fixed-format instruction words with the op code and address fields in the same position for every instruction would allow instructions to be fetched and decoded

a) independently.

b) dependently and in parallel.

c) independently and in serial.

d) independently and in parallel.

3) There are several factors that determine the number of instructions that a computer can perform in a second. Which of the following is NOT a factor?

a) Word size

b) Clock speed

c) Instruction format – fixed or variable

d) Number of steps required by each instruction type

4) 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

5) The fetch unit portion of the CPU consists of an instruction fetch unit and an instruction \_\_\_\_\_ unit.

a) decode

b) translate

c) decipher

d) conversion

6) The \_\_\_\_\_ unit contains the arithmetic/logic unit and the portion of the control unit that identifies and controls the steps that comprise the execution part for each different instruction.

a) fetch

b) decode

c) execution

d) conversion

7) Overlapping instructions - so that more than one instruction is being worked on at a time - is known as the

a) conveyor belt method.

b) pipelining method.

c) assembly line method.

d) accelerator method.

8) 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.

d) very fast in serial operation.

9) Which of the following is not a specific execution unit?

a) steering unit

b) LOAD/STORE unit

c) integer arithmetic unit

d) floating point arithmetic unit

10) A(n) \_\_\_\_\_ processor is one that can complete an instruction with each clock tick.

a) linear

b) direct

c) scalar

d) express

11) 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.

b) Instructions that have floating point operations.

c) Instructions that can be serialized.

d) Instructions that require the same number of CPU cycles complete.

12) 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

13) 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

d) fifty to one hundred

14) 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

b) decision

c) qualified

d) provisional

15) 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

16) 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.

17) What is the major drawback of Dynamic RAM (DRAM)?

a) cost

b) capacity

c) data loss

d) memory latency

18) 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.

19) Another method for increasing the effective rate of memory access is to divide memory into parts, called, \_\_\_\_\_ so that it is possible to access more than one location at a time.

a) block separation

b) high-low separation

c) memory interleaving

d) wide-path separation

20) 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.

d) a small block cache.

21) What does “locality of reference” mean?

a) most memory references occur concurrently

b) most memory references will pull data of numeric type

c) most memory references will be accessed in a predictable order

d) most memory references are confined to one or a few small regions of memory

22) The locality of reference principal makes sense because most of the instructions being executed at a particular time are

a) register-to-memory type instructions.

b) math and logical type instructions.

c) control and branch type instructions.

d) part of a small loop or a small procedure or function.

23) 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

24) When a cache miss occurs, however, there is a time delay while new data is moved to the cache. The time to move data to the cache is called \_\_\_\_\_ time.

a) stall

b) backup

c) write-though

d) cache back

25) Which of the following is most likely:

a) L1 cache has 32KB and L2 cache has 1MB

b) L1 cache has 1MB and L2 cache has 32KB

c) L1 cache has 32KB and L2 cache has 32KB

d) L1 cache has 1MB and L2 cache has 1MB

26) 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

27) 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

28) 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

29) 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

30) 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

31) 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).

32) Which of the following is not an advantage of adding more than one CPU processor within a single integrated chip?

a) Relatively inexpensive.

b) Reduce resource conflicts.

c) Programs can be divided into independent pieces and run separately.

d) Reduces power consumption, heat, and stress but gives equivalent processing power.

33) 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.

34) 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.

35) Simultaneous thread multiprocessing (STM) is also known as \_\_\_\_\_

a) hyperthreading

b) superthreading

c) expert threading

d) concurrent threading

**Chapter 9 Input / Output**

1) Which of the following is not a requirement for a computer system to handle I/O in a sufficient and effective manner?

a) Peripheral devices must be individually addressable.

b) peripheral devices must operate only in block mode.

c) Peripheral devices can initiate communication with the CPU.

d) Programmed I/O is suitable only for slow devices and individual word transfers.

2) An important difference between the I/O requirements of keyboards and disk drives is that

a) keyboard input is fast while disk drives are slow.

b) keyboard require constant monitoring while disk drives do not.

c) disk drives 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.

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, including 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

9) After interrupting a program in execution, and saving the program’s context, the computer then branches to a special program known as the

a) driver routine.

b) servicing program.

c) program service program.

d) interrupt handler program.

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) supervising.

12) Which of the following is not a function of how interrupts are used?

a) A completion signal

b) An abnormal event indicator

c) A means of allocating CPU time

d) A way of buffering large amounts of data

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, printer “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) atomic 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, are 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.

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

a) control instructions

b) limits instructions

c) prevalent instructions

d) privileged instructions

19) The software interrupt is very similar to which type of instruction?

a) STORE

b) LOAD

c) IF-THEN-ELSE

d) SUBROUTINE JUMB

20) The mnemonic for the x86 architecture instruction that simulates an interrupt is

a) SVC.

b) INT.

c) JMP.

d) GTO.

21) One way to assure that multiple programs do not unintentionally alter another program’s files or intermingle printer output is to

a) only execute one interrupt at a time.

b) give programs in execution the highest priority.

c) not allow programs in execution to be interrupted.

d) require that all I/O to shared devices be handled by the operating system.

22) When the device generating the interrupt request identifies its address as part of the interrupt, it is called

a) polling interrupt.

b) discrete interrupt.

c) vectored interrupt.

d) monitoring interrupt.

23) Multiple interrupts can be handled by assigning \_\_\_\_\_ to each interrupt.

a) priorities

b) a time delay

c) queue levels

d) execution tickets

24) Power failures, internal time sensitive events, or external events that are time sensitive will trigger interrupts that are

a) low priority events.

b) high priority events.

c) dependent on the device generating the interrupt.

d) measured for time-to-complete and scheduled accordingly.

25) Interrupts that can be temporarily disabled by program instructions are called

a) variable.

b) maskable.

c) changeable.

d) transferable.

26) Interrupts that can never be temporarily disabled by program instructions are called

a) invariable.

b) unchangeable.

c) nonmaskable.

d) non-transferable.

27) Interrupts are normally checked

a) during the operation of the instruction cycle.

b) immediately, without regard to the instruction cycle.

c) simultaneously with the beginning of an execution cycle.

d) after one instruction is finished and before another begins.

28) An I/O technique that transfers block data directly between the I/O controller and computer memory, is called

a) direct block access.

b) direct RAM access.

c) direct block transfers.

d) direct memory access.

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

a) bits.

b) 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 to 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.

d) The starting location of the block of data in memory.

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

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.

3) Most of the access time specified for secondary storage devices consists of

a) seek time.

b) latency time.

c) transfer time.

d) rotational delay.

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

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.

7) When a disk drive has multiple platters, the heads on each surface all line up. The set of tracks for all the surfaces form a geometric shape similar to a

a) bottle.

b) ellipse.

c) sphere.

d) cylinder.

8) In a disk drive where the drive motor turns at constant angular velocity, which is true of the linear velocity?

a) inner tracks move the fastest

b) outer racks move the fastest

c) middle tracks move the fastest

d) all tracks move at the same speed

9) The time it takes for the hard-disk read/write head to move from one track to another is called

a) latency.

b) seek time.

c) flight time.

d) arrival time.

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.

12) What system performance attribute is most increased by using a redundant array of independent disks (RAID)?

a) System reliability

b) System accessibility

c) System serviceability

d) System maintainability

13) In a mirrored array with 4 disks, each of the disks stores exactly the same data. The access time for a multiblock read is reduced by a factor of about \_\_\_\_\_.

a) tow

b) four

c) eight

d) sixteen

14) A special fault-tolerant computer system uses an array of 3 disks. The following logic is used to detect errors: If the data from all three disks is identical, then it is safe to assume that the integrity of the data is acceptable. If the data from one disk differs from the other two, then accept the data where both match and flag the other as an error. This logic is known as

a) disk logic.

b) majority logic.

c) difference logic.

d) greater-part logic.

15) A mirrored array requires a minimum of \_\_\_\_\_ disk drives.

a) two

b) three

c) four

d) five

16) The technique used for storage and retrieval in an LTO formatted data cartridge is called

a) data torrent.

b) LTO tasking.

c) data continuity.

d) data streaming.

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 that use 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.

21) An International standard maintained by a non-profit consortium to render 2-D and 3-D objects is known as

a) OpenGL.

b) DirectX.

c) ActiveX.

d) OpenSourse.

22) A key to the efficient operation of a GPU is the ability to dispatch instructions to the CPU cores in rapid succession, a process commonly called

a) flowing.

b) cramming.

c) smoothing.

d) streaming.

23) \_\_\_\_\_ is a standard GPU programming interface for general-purpose parallel programming that is implemented on a number of GPUs from different vendors.

a) OpenX

b) DirectX

c) OpenCL

d) ActiveX

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.

26) Which display technology consists of a thin display panel that contains red, green, and blue LEDs for each pixel with transistors for each LED that generate electrical current to light the LED?

a) CRT

b) LCD

c) FED

d) OLED

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.

d) QR software positions and sizes the image with the aid of large squares in three corners and a smaller square set in from the fourth corner.

32) With voice input data, the translation process requires the conversion of voice data into sound patterns known as

a) phonemes.

b) sound bytes.

C) sound slices.

d) part-of-speech.

33) The technology necessary to interpret audio data as voice input and to translate the data into alphanumeric form has improved in recent years. The translation process is aided by

a) Pulse Code Modulation (PCM) techniques that replace less precise analog modulation.

b) Improvements in digitizing audio data that arose from advances in recorded music.

c) Having the user pause between words to eliminate problems of continuous speech.

d) Pronunciation rules, grammar rules, and a dictionary of a particular language.

34) The capability of Smartphones to communicate with low power radio-frequency magnetic fields in close proximity with similar components is called

a) local field communications.

b) near field communications.

c) narrow field communications.

d) close proximity communications.

35) It is impossible to overemphasize the fact that, from the perspective of a computer, a network is

a) simply another I/O device.

b) just another hardware component.

c) the only device without a controller.

d) handled differently than all other I/O devices.

36) Protocols that describe a computer’s communication with the physical layer network are called

a) LAN access control protocols

b) shared access control protocols

c) medium access control protocols

d) medium admission control protocols

**Calculation Questions**

1) What is the capacity of a hard drive (in GB) consisting of 120,000 tracks, 4,000 sectors, and 4 surfaces? Assume each block has 512 bytes.

Sol: On one surface, the size is 120,000 × 4,000 × 512 bytes = 245,760,000,000 bytes

Convert to GB: 245,760,000,000 bytes per surface × (1G/2^30 bytes) = 228.9 GB per surface

Total capacity of drive is (4 surfaces) × (228.9 GB/surface) = 916 GB

2) What is the average rotational latency of a hard drive rotating at 7,200 RPM or 120 revolutions per second? (Give your answer in milliseconds)

Sol: Average rotational latency time = 0.5 × 1/rotation speed

Change rotational speed to revolution per sec: 7,200 rev/min × (1 min/60 seconds) = 120 rev/sec

Average rotational latency time = 0.5 × 1/120 rev/sec = 0.004167 sec = 4.167 ms

3) What is the transfer time for a hard drive rotating at 7,200 RPM or 120 revolutions per second? Assume there are 30 sectors per track. (Give your answer in milliseconds)

Sol: Transfer time = 1/number of sectors × rotational speed

Transfer time = (1/30 sector/track) × (1/120 rev/track) = 0.000278 sec = 0.278 ms

**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

3) The PCI-Express is made up of a bundle of thirty-two serial, bidirectional point-to-point buses. Each bidirectional bus is called a(n)

a) lane.

b) sub-bus.

c) inner bus.

d) component bus.

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.

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 devices 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) 0.5

b) 1

c) 10

d) 100

10) USB uses a \_\_\_\_\_ connection system, in which hubs are used to provide multiple connection points for I/O devices.

a) sequential

b) master-slave

c) peer-to-peer

d) hierarchical

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.

13) Devices that can be added and removed at any time without powering down the system are known as \_\_\_\_\_ devices.

a) pluggable

b) swappable

c) fault-tolerant

d) hot pluggable

14) The USB protocol allows packets to be scheduled for delivery at regular time intervals. This technique is known as

a) synchronous data transfer.

b) asynchronous data transfer.

c) isochronous data transfer.

d) bisynchronous data transfer.

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) 0.5

b) 1

c) 10

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 instructions

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.

21) As an alternative approach to multiprocessing systems, several autonomous computers can be tied together through a data communications link where each system can share data and exchange information within the system complex. This approach is called

a) free coupled systems.

b) fixed coupled systems.

c) tightly coupled systems.

d) loosely coupled systems.

22) The method of connecting loosely coupled computers together with a dedicated communication channel or link that passes messages between machines is called

a) binding.

b) bunching.

c) grouping.

d) clustering.

23) The determining factor that distinguishes a loosely coupled system is the \_\_\_\_\_ of each computer within the system complex or network.

a) autonomy

b) subjugation

c) dependence

d) interdependence

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

a) hub.

b) node.

c) server.

d) member.

25) Clustering is a fundamental technology in the design of high performance computing systems. Which of the following is not a benefit to clustering?

a) scalability

b) lower cost

c) increased availability

d) programming is easier

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

27) Clustering can be used to create fault tolerant systems, because, if a node were to fail, software controlling the cluster can simply switch processing to other nodes in the cluster, an operation called

a) failover.

b) faultover.

c) node changing.

d) crash prevention.

28) There are two primary models used for clustering, the \_\_\_\_\_ model, and the \_\_\_\_\_ model.

a) share-CPU, share-disk

b) share-CPU, share network

c) share-nothing, share-CPU

d) shared-nothing, shared-disk

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.

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.

32) Blade servers are computers mounted on a board similar to a motherboard that can be plugged into connectors on a rack. The blades themselves are

a) built from proprietary hardware.

b) built from IBM proprietary hardware.

c) built from standard off-the-shelf parts.

d) built from proprietary hardware, but commercial operating systems.

33) Nearly all supercomputing capability is based on

a) clustering technology.

b) Single-core technology.

c) quantum processing technology.

d) processors from Intel and AMD.

34) Systems that use the spare processing capacity of computers connected to a network is called

a) grid computing.

b) supercomputing.

c) cluster computing.

d) parallel computing.

35) One of the issues for systems that use the spare processing capacity of computers connected to a network is

a) cost.

b) fault tolerance.

c) high availability.

d) security and privacy for the client machines.

**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.

4) A \_\_\_\_\_ is equivalent to an envelope containing pages of data.

a) packet

b) message

c) segment

d) container

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.

7) The rate of speed with which data can be moved successfully through the channel is usually measured as a

a) bit rate.

b) file rate.

c) block rate.

d) CPU cycle rate.

8) Which is not an example of an unguided medium?

a) microwave

b) cellular phone

c) broadcast radio

d) USB connection from computer to smartphone

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) one-way channels.

b) simplex 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.

13) A relatively small number of standard protocols, consisting primarily of the \_\_\_\_\_ protocol suites, satisfy nearly all of the communication requirements for modern data communication networks.

a) TCP/IP and UDP

b) TCP/IP and BGP

c) TCP/IP and ATM

d) TCP/IP and Ethernet

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

d) mesh

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

17) Which type of topology describes the actual layout of the wiring for the network?

a) virtual

b) logical

c) tangible

d) physical

18) Which type of topology defines the operational relationship between the various network components?

a) virtual

b) logical

c) physical

d) tangible

19) Which type of network connects computers and other supporting devices over a relatively small localized area, typically a room, the floor of a building, a building, or multiple buildings within close range of each other?

a) LAN

b) CAN

c) WAN

d) Intranet

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

22) Which Ethernet technology uses radio-based signals to communicate to devices connected on the local area network?

a) Wi-Fi

b) ring Ethernet

c) mesh Ethernet

d) hub-based Ethernet

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

24) Each wireless unit is connected by radio to a base station \_\_\_\_\_ that is somewhat equivalent to a hub.

a) media site

b) access site

c) media point

d) access point

25) Which type of network is used to interconnect local area networks? The primary motivation for this type of network is to improve overall performance of a larger network by creating separate local area networks for groups of users who communicate primarily with each other.

a) link networks

b) extended networks

c) connected networks

d) backbone networks

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.

28) An access router that is located between the public Internet and the internal LAN is called a(n)

a) edge router.

b) border router.

c) exchange router.

d) perimeter router.

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.

32) What makes virtual circuits more efficient in the use of transmission resources than traditional circuit switching?

a) Links and intermediate nodes are shared with other connections.

b) A virtual circuit uses multiple links to send data over possibly different channel paths.

c) There is a dedicated path for the exclusive use of the sender-receiver pair for the entire time of the connection.

d) There is a virtual path for the exclusive use of the sender-receiver pair for the entire time of the connection.

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.

35) Which of the following is not a major organization that participates in the creation of standards for data communications, networks, and internetworks?

a) Internet Engineering Task Force (IETF)

b) Association for Computing Machinery (ACM)

c) International Organization for Standardization (ISO)

d) International Telecommunications Union Telecommunications Group (ITU-T)

**Calculation Questions**

1) How many connections are required for 30 nodes to be connected in a full mesh topology?

Sol: Number of connections = (notes × (notes - 1)) / 2 = 30 × 29 / 2 = 435

**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.

4) The data link layer is divided into \_\_\_\_\_ and \_\_\_\_\_ sublayers.

a) medium access control; logical link control

b) physical access control; logical link control

c) medium access control; virtual link control

d) physical access control; virtual link control

5) A \_\_\_\_\_ occurs when multiple nodes access and send data simultaneously in such a way that their messages become mixed together and garbled.

a) conflict

b) collision

c) confrontation

d) commingling

6) Switched Ethernet does not actually implement the \_\_\_\_\_ protocol, because connections are point-to-point and messages can’t become mixed together and garbled.

a) ARP

b) L2TP

c) HDLC

d) CSMA/CD

7) What protocol is used to discover the relation between an IP address and a corresponding MAC address?

a) ARP

b) L2TP

c) HDLC

d) CSMA/CD

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

10) Remember that the IP datagram may pass through different types of links. For certain types of physical layer connections, it is necessary to further divide the IP datagrams into smaller packets before they are delivered as frames to the data link layer. What are these smaller packets called?

a) pages

b) parcels

c) fragments

d) scatter grams

11) Although IP attempts to route every datagram to its final destination, it is a connectionless, packet switching service. IP is a(n) \_\_\_\_\_ delivery service.

a) reliable best-effort

b) unreliable best-effort

c) reliable and guaranteed

d) unreliable but guaranteed

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

16) TCP establishes a connection at the request of a network application. To initiate a connection, TCP sends a control packet to TCP at the Web site, requesting a connection; this results in a brief back-and-forth series of requests and acknowledgments known as

a) binding.

b) collaborating.

c) handshaking.

d) service handling.

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)

19) What is the abbreviation for the protocol that translates domain names into IP addresses?

a) NAT

b) UDP

c) DNS

d) DHCP

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

21) Two additional benefits of DNS services are: 1) permits the use of alias names that share the same IP address and 2) \_\_\_\_\_.

a) perform load balancing for replicated servers

b) perform authentication on requesting computers

c) lower cost associated with managing IP addresses

d) enhance performance by caching multiple requests

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

23) The variation in delay from packet to packet is known as \_\_\_\_\_. It is particularly important parameter in the transmission of video and audio.

a) QoS

b) jitter

c) packet delay

d) network delay propagation

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

26) Keeping the content of data traversing the network and information about the communication taking private is known as

a) encryption.

b) authentication.

c) confidentiality.

d) nonrepudiation.

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.

29) Reading data in all the packets as they pass through the network is known as

a) packet sniffing.

b) switch tapping.

c) packet spoofing.

d) packet cracking.

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.

33) What is the name of the standard that includes the conversion of voice, as well as data, into IP data packets for transmission, as part of the specification?

a) VOIP

b) OSI LTE

c) Long Term Evolution (LTE)

d) Third generation mobile network

34) In cellular technology, the movement of the users from cell to cell is called a

a) handoff.

b) handover.

c) cell transfer.

d) next cell transfer.

35) MPLS operates at the \_\_\_\_\_ layer.

a) network

b) data link

c) transport

d) application

**Calculation Questions**

1) In the Ethernet frame described in the text (figure 13.5), what is the minimum and maximum number of bytes?

Sol: Preamble and start frame delimiter = 8

Destination and Source MAC address = 12

Number of Data bytes = 2

Payload minimum = 46

CRC = 4

The minimum is 8 + 12 + 2 + 46 + 4 = 72 bytes

Preamble and start frame delimiter = 8

Destination and Source MAC address = 12

Number of Data bytes = 2

Payload minimum = 1500

CRC = 4

The maximum is 8 + 12 + 2 + 1500 + 4 = 1526 bytes

2) Suppose a higher layer application wants to send a file 12MB in size across an Ethernet LAN. How many Ethernet frames are needed? Assume the largest Ethernet payload is 1500 bytes.

Sol: The file is 12MB × 1,048,576 = 12,582,912 bytes

12,582,912 / 1500 = 8389

8389 Ethernet frames are needed

**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 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

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).

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 channels 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 up 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

c) sequence

d) large data packet

34) The most recent versions of Wi-Fi use a modulation technique called

a) frequency division multiplexing (FDM).

b) amplitude division multiplexing (ADM).

c) quadrature amplitude modulation (QAM).

d) orthogonal frequency division multiplexing (OFDM).

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

26) On IBM-type PCs, critical device drivers for keyboard, display, and boot disk needed during system start-up are stored

a) in RAM.

b) main memory.

c) in system BIOS.

d) on the hard-drive.

27) A \_\_\_\_\_ is an executing program. It is considered the standard unit of work within a computer system.

a) routine

b) process

c) procedure

d) executable

28) What memory management technique creates the illusion of a memory space that is potentially much larger than the actual amount of physical storage installed in the computer system?

a) Virtual ROM

b) virtual storage

c) artificial RAM

d) artificial storage

29) The operating system configuration of UNIX is an example of a

a) layered configuration.

b) monolithic configuration.

c) hierarchical configuration.

d) microkernel configuration.

30) An operating system can be organized in a layered, hierarchical structure, where the outer most layers

a) host the kernel.

b) hold the microkernel.

c) are visible to the user.

d) interact with the hardware.

31) An operating system can be organized in a layered, hierarchical structure, where the inner most layers

a) host the kernel.

b) hold the microkernel.

c) are visible to the user.

d) interact with the hardware.

32) The predominant operating system type in current use are \_\_\_\_\_ multitasking systems.

a) mobile

b) real-time

c) embedded

d) single user

33) Operating systems designed for small hand-held devices are \_\_\_\_\_ operating systems.

a) mobile

b) real-time

c) embedded

d) single user

34) Operating systems that have applications monitoring or controlling I/O devices that must respond within a specific time are called

a) mobile.

b) real-time.

c) distributed.

d) single user.

**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.

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

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

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

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

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

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).

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.

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

27) At any given time, one window on a desktop is \_\_\_\_\_, meaning that it will respond to the keyboard and mouse.

a) active

b) explicit

c) working

d) responsive

28) Early implementation of gesture- and voice-based technology was designed primarily for

a) thin clients.

b) set-top boxes.

c) computer games.

d) high-end workstations.

29) Voice recognition is based on \_\_\_\_\_ recognition technology.

a) word

b) sound

c) sentence

d) phoneme

30) X Window works by separating the software that actually produces the display image on the screen from the application program that creates the image and requests the display into a somewhat unusual \_\_\_\_\_ arrangement.

a) cooperative

b) client-server

c) master-slave

d) loosely coupled

31) In the X Window environment, the program that produces the image on the screen is known as a \_\_\_\_\_ server.

a) web

b) video

c) display

d) network

32) Which of the following is a portable script language?

a) Perl

b) Python

c) JavaScript

d) All of the above

33) Which of the following is NOT an important feature of a command language?

a) Branch and loop

b) Print messages on the screen

c) Notifying the system administrator

d) Assign and change the value of a variable

34) Start-up configuration files can only be modified by the

a) user.

b) operating system.

c) system administrator.

d) network administrator.

35) Assigning system resources such as memory through \_\_\_\_\_ assures that a program cannot overwrite memory in use by a different program.

a) the API

b) powershell

c) a script program

d) a command shell

**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

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

b) Video

c) Database

d) Numerical input

3) What type of data file consists of alphanumeric text that will serve as the input to a compiler?

a) Video

b) Database

c) Directory

d) Source code

4) What type of data file consists of information about other files?

a) Video

b) Database

c) Directory

d) Source code

5) The \_\_\_\_\_ of the file is the way in which the data is actually stored on a disk.

a) real view

b) image view

c) logical view

d) physical view

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

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

8) One common method for retrieving records randomly from a file uses one field, known as the \_\_\_\_\_ field, as an index to identify the proper record.

a) key

b) main

c) target

d) critical

9) The \_\_\_\_\_ is part of the filename and is used to identify the file type.

a) file prefix

b) file location

c) file argument

d) file extension

10) Some systems allow a data file to specify the program it is to be used with. This property is called a(n)

a) association.

b) attachment.

c) relationship.

d) membership.

11) The \_\_\_\_\_ is the smallest unit that the file management system can store or retrieve in a single read or write operation.

a) sector

b) chunk

c) cluster

d) byte

12) If the allocation unit size if too small,

a) file access is slower.

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

15) Which of the following is NOT an example of a record-based file operation?

a) Rename a file

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

17) Typing command DIR PROG?.TXT in a Windows directory will return which files?

a) PROG.DAT

b) PROG1.TXT

c) PROG2.TXT

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.

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

20) \_\_\_\_\_ access is fast, since no seek time is required to find each succeeding record assuming that the file is stored contiguously.

a) Random

b) Parallel

c) Sequential

d) Record-based

21) A \_\_\_\_\_ occurs when two different records calculate to the same hash number (logical record number).

a) crash

b) impact

c) conflict

d) collision

22) Fragmentation of a disk occurs when

a) files are deleted.

b) files are moved.

c) files grow too large for their anticipated storage and must be moved.

d) All of the above

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.

c) connected blocking.

d) associated allocation.

24) One method of maintaining a free space list is to provides a table with one bit for each block on the disk. The bit for a particular block is set to 1 if the block is in use and to 0 if the block is free. This table is called the

a) Bitmap Table.

b) File Map Table.

c) Status Map Table.

d) File Allocation Table.

25) The universal Data Format (UDF) supports High Definition and Blu-Ray DVD formats. UDF directory format is \_\_\_\_\_, consistent with other file directory systems.

a) flat

b) ad hoc

c) matrix

d) hierarchical

26) Many systems provide a means for dividing physical devices, particularly disks, into independent sections called

a) disks.

b) RAIDs.

c) partitions.

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.

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

c) root folders

d) working folders

29) What protocol is designed for accessing and maintaining distributed network directory information services?

a) UDP

b) FTP

c) LDAP

d) DHCP

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.

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

c) ACLs are an ideal file protection service

d) Mechanisms are needed to check the ACL whenever a file is accessed

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

33) The first line of defense against file system failure is a well-defined set of proper system \_\_\_\_\_ procedures.

a) backup

b) network storage

c) file maintenance

d) backup and file maintenance

34) \_\_\_\_\_ systems extend file system failure protection to include automated file recovery procedures in the event of a disk crash or system failure during file access operations.

a) Buffer file

b) Memory file

c) Application file

d) Journaling file

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.

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

3) When powering up the computer, the initial program loading and start-up is performed by using a \_\_\_\_\_ program that is built permanently into a read-only part of memory for the computer.

a) DRAM

b) redirect

c) bootstrap

d) start-state initialization

4) When powering up the computer, ROM is checked for errors by calculating an algebraic function of the 1s and 0s, known as a \_\_\_\_\_\_\_\_\_\_\_\_\_, and comparing that value with a predetermined correct value.

a) checksum

b) ROM sum

c) ROM check

d) Read/Write pass

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

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.

7) Processes that work together are known as

a) parallel processes.

b) concurrent processes.

c) cooperating processes.

d) independent processes.

8) To keep track of each of the different processes that are executing concurrently in memory, the operating system creates and maintains a block of data for each process in the system. This data block is known as a(n)

a) process table

b) process control block

c) interactive process list

d) coordinating process table

9) The action of moving a process from the ready state to the running state is called \_\_\_\_\_ the process.

a) sending

b) jumping

c) allocating

d) dispatching

10) A process in execution will be suspended if the process is waiting for

a) an I/O request to finish.

b) data result from another process.

c) a completion signal from another process.

d) Any of the above

11) \_\_\_\_\_ systems will allow a running process to continue running until it is completed or blocked.

a) Multiuser

b) Preemptive

c) Cooperating

d) Nonpreemptive

12) \_\_\_\_\_ systems will limit the time that the program remains in the running state to a fixed length of time corresponding to one or more quanta.

a) Multiuser

b) Preemptive

c) Cooperating

d) Nonpreemptive

13) A \_\_\_\_\_ represents a piece of a process that can be executed independently of other parts of the process.

a) fork

b) stack

c) thread

d) subroutine

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

16) Which of the following System Dispatching Objectives is concerned with maximizing the number of jobs completed in any given time period?

a) Ensure fairness

b) Maximize throughout

c) Minimize response time

d) Minimize turnaround time

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

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

b) Maximize throughout

o) Maximize CPU utilization

d) Maximize resource allocation

20) Which of the System Dispatching Objectives does the algorithm shortest job first (SJF) satisfy?

a) Maximize throughout

b) Minimize response time

c) Minimize turnaround time

d) Maximize resource allocation

21) When memory is partitioned into fixed spaces, \_\_\_\_\_ fragmentation is likely to occur.

a) outer

b) central

c) internal

d) external

22) The solution to the problems inherent with fixed partition and variable partition memory management schemes are found in

a) virtual memory.

b) virtual programming

c) using smaller OS kernels

d) larger hard drive capacity.

23) Variable partitioning will, after a while, result in \_\_\_\_\_ fragmentation, since the replacement of one program in an available space with another will almost always result in a bit of space left over.

a) outer

b) central

c) internal

d) external

24) When memory is divided into frames, the address within the frame is called a(n)

a) bias

b) offset

c) modifier

d) resultant

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

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.

c) The swap space is updated.

d) The referenced page it pulled out of memory.

27) During execution, programs exhibit a tendency to stay within small areas of memory during any given period of time. This property is called the

a) locality of reference.

b) small area of execution.

c) residual execution property.

d) neighboring instruction concept.

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)

d) Second Chance Page replacement

29) A system in a constant state of replacing pages is known as

a) thrashing.

b) page bouncing.

c) cyclic page faults.

d) unbounded page faults.

30) On a busy system, it is common to have a number of disk requests pending at any given time. With rotating drives, it is preferable to use an algorithm that minimizes \_\_\_\_\_ distances.

a) seek

b) operating

c) block

d) sector

31) In regard to disk request algorithms, the problem with the shortest distance first (SDF) scheduling algorithm is that it suffers from the possibility of

a) reduced throughput.

b) poor turnaround time.

c) idcreased resource utilization.

d) indefinite postponement.

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).

33) In client-server systems the operating system software on the server can communicate with every computer on the network, but client software communicates only with the server. In contrast, \_\_\_\_\_ permits communication between any two computers on the network.

a) network-to-network software

b) peer-to-peer network software

c) client-to-client network software

d) server-to-server network software

34) When one process has a resource that another process needs to proceed, and the other process has a resource that the first process needs, then both are waiting for an event that can never occur. This situation is called

a) gridlock

b) impasse

c) deadlock

d) congestion

35) It is possible to use a powerful computer to simulate a number of distinct computers. The process for doing so is called

a) PC modeling.

b) virtualization.

c) simulated computing.

d) generalized computing environment.