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TRUE/FALSE

1. Computers are now used in radiology to process images.

   ANS: T
   The central role of the computer in digital imaging systems is to process and facilitate the display of images and information.

   REF: 36 | 46

2. A bit is a contraction for binary digit.

   ANS: T
   A binary digit, or a bit, is a single binary number.

   REF: 36

3. Sixteen binary bits (two bytes) equal a word.

   ANS: T
   Eight binary bits equal one byte. Sixteen bits, or two bytes, equal a word.

   REF: 36

4. The keyboard is an example of output hardware.

   ANS: F
   The keyboard is an example of input hardware.

   REF: 37

5. An analog-to-digital converter consists of a sampler, a quantizer, and a coder.

   ANS: T
   An analog-to-digital converter converts the analog signal into "a sequence of numbers having finite precision." The essential parts of an analog-to-digital converter include a sampler, a quantizer, and a coder.

   REF: 37

6. The arithmetic-logic unit is part of the control unit.

   ANS: F
   The arithmetic-logic unit is part of the central processing unit.

REF: 39

7. Natural languages include acronyms such as BASIC, COBOL, and FORTRAN.

   ANS: F
   Procedural languages include those acronyms.

   REF: 44

8. One kilobyte is equal to 1000 bytes.

   ANS: T
   One thousand bytes equal 1 kilobyte.

   REF: 36

9. A group of 16 bits equals 1 byte.

   ANS: F
   A group of 8 bits equals 1 byte.

   REF: 36

10. The word *computer* means a machine for solving problems.

    ANS: T
    A computer is a machine for solving problems. Specifically, the modern computer is a high-speed electronic computational machine that accepts information in the form of data and instructions through some input device and processes this information with arithmetical and logical operations from a program stored in its memory. Essentially, people can perform the same tasks; the word *computer* historically referred to a person.

    REF: 31

MULTIPLE CHOICE

1. A computer system consists of:
   A. people and hardware
   B. hardware and software
   C. software and people
   D. hardware, software, and people

   ANS: D
   A computer system consists of at least three elements: hardware, software, and computer users.

   REF: 31

2. Computer processing involves, in order:

A. programming, output, and input
B. input, output, and processing
C. input, processing, and output
D. input, programming, and output

ANS: C
Input of information happens first, then the data are processed, and finally the results are sent to an output device.

REF: 31

3. Which of the following characterizes fifth-generation computers?
A. vacuum tubes used for memory
B. silicon-based circuitry
C. transistors
D. artificial intelligence

ANS: D
Fifth-generation computers mimic human intelligence, also referred to as artificial intelligence.

REF: 33

4. Which term relates to first-generation computers?
A. silicon-based circuitry
B. MFLOPS
C. vacuum tubes
D. transistors

ANS: C
First-generation computers featured vacuum tubes used for memory.

REF: 32

5. Which of the following became the first commercially available computer?
A. universal automatic computer
B. electronic tabulator
C. difference engine
D. abacus

ANS: A
In 1951, the universal automatic computer became the first commercially available computer.

REF: 32

6. Computed tomography scanners and magnetic resonance imagers both use a _____for image processing.
A. microcomputer
B. minicomputer
C. supercomputer

D. mainframe computer

ANS: B
Midrange computers, or minicomputers, are used in computed tomography and magnetic resonance imaging.

REF: 33

7. An eight-bit microprocessor can represent:
   A. 8 numbers
   B. 16 numbers
   C. 64 numbers
   D. 256 numbers

   ANS: D
   An 8-bit microprocessor represents 256 numbers.

   REF: 33

8. Using separate computers to perform different tasks is referred to as:
   A. distributed processing
   B. parallel processing
   C. serial processing
   D. multitasking

   ANS: A
   Distributed processing entails separate computers performing different tasks in such a way that their combined work can contribute to a larger goal.

   REF: 34

9. Which of the following describes a method in which instructions are fetched and decoded at any given time in various stages?
   A. pipeline processing
   B. multiprocessing
   C. multitasking
   D. serial processing

   ANS: A
   Pipelining is a method in which several program instructions are in various stages of being fetched or decoded.

   REF: 35

10. Which classification of computers are large, high-capacity computers that can process data at extremely high speeds?
    A. supercomputer
    B. minicomputer
    C. microcomputer
    D. mainframe computers

ANS: A
Supercomputers are large, high-capacity computers that can process data at extremely high speeds. They are used in oil exploration studies, weather forecasts, research (especially in weapons), and scientific modeling.

REF: 33

11. The introduction of the integrated circuit etched onto silicon chips and using magnetic disks for storage was a feature of which generation of computers?
    A. first generation
    B. second generation
    C. third generation
    D. fourth generation

    ANS: C
    Third-generation computers were marked by the introduction of the integrated circuit etched onto silicon chips and use of magnetic disks for storage.

    REF: 33

12. The analog-to-digital converter:
    A. converts analog input into digital data
    B. converts digital data into analog data
    C. converts binary digits into voltage
    D. converts binary digits into a computed tomography image

    ANS: A
    If the computer is a digital computer and the input is analog, an analog-to-digital converter is needed to convert the analog input into digital data for processing.

    REF: 37

13. All the following represent hardware *except* the:
    A. keyboard
    B. computer program
    C. mouse
    D. cathode ray tube

    ANS: B
    The keyboard is considered input hardware, the mouse is nonkeyboard input hardware, and the cathode ray tube is soft copy output hardware. The computer program is software.

    REF: 37 | 38 | 40 | 41

14. Which of the following is an example of computer software?
    A. magnetic disks
    B. magnetic tapes and drums
    C. optical disks
    D. computer programs

    ANS: D

Sets of instructions, called computer programs, are classified as computer software.

REF: 31

15. Which of the following directs the activities of the computer using instructions stored in memory?
    A. arithmetic-logic unit
    B. control unit
    C. registers and buses
    D. internal memory

    ANS: B
    The control unit directs the activities of the computer through programs stored in memory.

    REF: 39

16. Which of the following chips provide temporary storage of data and programs to be processed by the central processing unit?
    A. ROM chips
    B. RAM chips
    C. PROM chips
    D. EEPROM chips

    ANS: B
    RAM (random access memory) chips provide for temporary storage of data and programs.

    REF: 40

17. Computer memory capacity is expressed in all of the following, *except:*
    A. megabytes (MB)
    B. gigabytes (GB)
    C. terabytes (TB)
    D. megagram (MG)

    ANS: D
    Memory capacity is measured in bytes, including megabytes, gigabytes, and terabytes.

    REF: 36

18. The approaches to secondary storage include all of the following *except:*
    A. semiconductor chips or integrated circuits
    B. magnetic tapes
    C. magnetic disks
    D. optical disks

    ANS: A
    Storage hardware devices include magnetic tapes and disks and optical disks, which constitute secondary or auxiliary storage.

    REF: 41

19. Which of the following storage devices has a high capacity and provides very fast access to stored data?
    A. $3\frac{1}{2}$-inch diskette, double-sided, high density
    B. CD-ROM optical disk
    C. magnetic tape streamer
    D. digital audio tape

    ANS: D
    Digital audio tapes are high-capacity tapes that provide very fast access to the data stored.

    REF: 42

20. The use of graphic symbols to indicate the sequence of operations needed to solve a problem is called a:
    A. pseudocode
    B. top-down program design
    C. flow chart
    D. logic structure

    ANS: C
    Flow charting involves the use of graphic symbols to indicate the sequence of operations needed to solve a problem.

    REF: 44

21. What is the program stored in ROM that starts up the computer and loads the operating system?
    A. bootstrap loader
    B. input-output system program
    C. BASIC
    D. LOGO

    ANS: A
    The bootstrap loader is stored in ROM, which starts up the computer and loads the operating system.

    REF: 45

22. The following are examples of applications software *except:*
    A. Microsoft Works
    B. First Choice
    C. Framework
    D. MS-DOS

    ANS: D
    Applications software refers to programs developed to perform specific types of work, such as the creation of text and images, manipulation of words and numbers, or communication of information. Examples of application software include Microsoft Works, First Choice, and Framework.

REF: 45

23. The following are examples of operating systems *except:*
    A. UNIX
    B. Microsoft Word
    C. OS/2
    D. Macintosh OS

    ANS: B
    Some major operating systems include UNIX, OS/2, and Macintosh OS.

    REF: 45

24. Transmission media or channels include all of the following *except:*
    A. coaxial cable
    B. twisted pair wires
    C. radio waves
    D. telephone lines

    ANS: B
    Transmission media or channels include telephone lines, coaxial cable, and radio waves.

    REF: 46

25. Which of the following converts digital data to analog signals and analog signals back to digital data?
    A. telephone wires
    B. modems
    C. computer terminal
    D. multiplexer

    ANS: B
    The modem modulates, or converts digital data to analog signals, and demodulates, or converts analog signals to digital data.

    REF: 46

26. Which of the following can handle not only communications data but also audio and video signals at the same time over the same cables?
    A. integrated services digital network (ISDN)
    B. modem
    C. coaxial cable
    D. multiplexer

    ANS: A
    Integrated services digital network (ISDN) can handle data communications and allows audio and video signals to be transmitted simultaneously over cable.

    REF: 47

27. Star networks can be applied to which of the following?

A. bus network
B. local area network
C. hierarchical network
D. ring network

ANS: B
When computers and other hardware located in the same building are linked through a topology, they create a local area network.

REF: 47

28. The computer science application that deals essentially with the display of pictures on a computer screen is called:
A. artificial intelligence
B. computer graphics
C. expert systems
D. virtual reality

ANS: B
Computer graphics is the display of pictures, as opposed to only alphabetical and numerical characters on a computer screen.

REF: 54

29. Which of the following uses software as a tool to provide additional information to the radiologist to make a diagnosis?
A. expert system
B. virtual reality
C. computer-aided detection (CAD)
D. artificial intelligence

ANS: C
In computer-aided detection, the software is used as a tool to provide additional information to the radiologist and other related individuals to make a diagnosis.

REF: 54

30. Which of the following is not an imaging application of the computer?
A. computed tomography
B. film library functions
C. magnetic resonance imaging
D. digital radiography

ANS: B
Picture archiving and communication systems are used to digitally acquire medical images from various modalities such as computed tomography, magnetic resonance imaging, ultrasonography, nuclear medicine, and digital radiography.

REF: 50

31. Which of the following is used as a workstation in computed tomography?

A. minicomputer
B. microcomputer
C. supercomputer
D. mainframe computer

ANS: B
Workstations, a category of microcomputers, are now used in computed tomography and magnetic resonance imaging.

REF: 33

32. Secondary storage refers to all of the following *except:*
A. read-only memory
B. magnetic tapes
C. magnetic disks
D. optical disks

ANS: A
Secondary storage devices include magnetic tapes, magnetic disks, and optical disks.

REF: 41

33. Which of the following uses a laser beam to write and read information from it?
I. magnetic disks
II. optical disks
III. magnetic tapes
A. I only
B. II only
C. III only
D. I, II, and III

ANS: B
Optical disk storage involves the use of a laser beam to write data on the surface of the metallic disk.

REF: 43

34. Which imaging communication protocol is used with picture archiving and communications systems?
A. health level
B. digital imaging and communications in medicine
C. hospital information system
D. radiology information system

ANS: B
Health Level-7 is the standard application protocol for use in most hospital information systems and radiology information systems; digital imaging and communication in medicine is the imaging communication protocol for picture archiving and communications systems.

REF: 52

35. Which of the following can damage a computer program without the user knowing about it?
    A. viruses
    B. expert systems
    C. the use of incorrect syntax
    D. the Internet

    ANS: A
    A virus is a set of illicit instructions that passes itself onto other programs with which it comes in contact.

    REF: 54

MATCHING

Please match the following computer concepts for each group. All answer selections will be used just once.

A. Mimicking human intelligence
B. Secondary storage
C. Destructive program
D. Modem
E. UNIX
F. Output hardware
G. CD-ROM

1. Magnetic tape
2. Operating system
3. Display monitor
4. Optical disk
5. Virus
6. Artificial intelligence
7. Modulation-demodulation

1.	ANS: B	REF:	41
2.	ANS: E	REF:	45
3.	ANS: F	REF:	40 | 41
4.	ANS: G	REF:	43
5.	ANS: C	REF:	54
6.	ANS: A	REF:	33
7.	ANS: D	REF:	46

Please match the following computer concepts for each group. All answer selections will be used just once.

A. Digital integrated circuit
B. A string of 8 bits
C. 2 bytes
D. 1,000,000 bytes
E. Internal memory
F. 1000 bytes

G. Bit
H. Optical disk

8. Binary digit
9. Kilobyte
10. Byte
11. Word
12. Megabyte
13. Laser beam
14. RAM and ROM
15. Microprocessor

8.	ANS: G	REF: 36
9.	ANS: F	REF: 36
10.	ANS: B	REF: 36
11.	ANS: C	REF: 36
12.	ANS: D	REF: 36
13.	ANS: H	REF: 43
14.	ANS: E	REF: 40
15.	ANS: A	REF: 33