Checkpoint

1.1: What is a program?

Answer: A program is a set of instructions that a computer follows to perform a specific task. It is a sequence of instructions that are executed by the computer to perform a specific task or solve a particular problem.

1.2: What is hardware?

Answer: Hardware refers to the physical components that make up a computer system. It includes all the tangible components of a computer system such as the monitor, keyboard, mouse, printer, motherboard, CPU, hard disk, and other peripheral devices.

1.3: List the five major components of a computer system.

Answer: The five major components of a computer system are Input devices, Output devices, Secondary storage devices, Main Memory, and CPU. Input devices are used to input data into the computer, output devices are used to display or output data from the computer, secondary storage devices are used to store data for long periods of time, main memory is used to store data and programs temporarily while the computer is running, and the CPU is responsible for executing instructions and controlling the operation of the computer.

1.4: What part of the computer runs programs?

Answer: The Central Processing Unit (CPU) is the part of the computer that actually runs programs. It is responsible for executing instructions and controlling the operation of the computer.

1.5: What part of the computer serves as a work area to store a program and its data while the program is running?

Answer: The main memory (or RAM) serves as a work area to store a program and its data while the program is running.

1.6: What part of the computer holds data for long periods, even when there is no power to the computer?

Answer: The secondary storage devices (such as hard disks, SSDs, and other non-volatile memory) hold data for long periods of time, even when there is no power to the computer.

1.7: What part of the computer collects data from people and other devices?

Answer: Input devices collect data from people and from other devices.

1.8: What part of the computer formats and presents data for people or other devices?

Answer: Output devices format and present data for people or other devices.

1.9: What fundamental set of programs controls the internal operations of the computer's hardware?

Answer: The operating system is the fundamental set of programs that control the internal operations of the computer's hardware.

1.10: What do you call a program that performs a specialized task, such as a virus scanner, a file compression program, or a data backup program?

Answer: A program that performs a specialized task is called a utility program.

1.11: Word processing programs, spreadsheet programs, email programs, web browsers, and game programs belong to what category of software?

Answer: Application software - Word processing programs, spreadsheet programs, email programs, web browsers, and game programs belong to the category of application software.

1.12: What amount of memory is enough to store a letter of the alphabet or a small number?

Answer: One byte / A single byte of memory is enough to store a letter of the alphabet or a small number.

1.13: What do you call a tiny "switch" that can be set to either on or off?

Answer: A tiny "switch" that can be set to either on or off is called a bit.

1.14: In what numbering system are all numeric values written as sequences of 0s and 1s?

Answer: All numeric values are written as sequences of 0s and 1s in the binary numbering system.

1.15: What is the purpose of ASCII?

Answer: The purpose of ASCII (American Standard Code for Information Interchange) is to represent text in computers, telecommunications equipment, and other devices that use text. It is an encoding scheme that uses a set of 128 numeric codes to represent English letters, various punctuation marks, and other characters. These numeric codes are used to store characters in a computer's memory. (ASCII stands for the American Standard Code for Information Interchange.)

1.16: What encoding scheme is extensive enough to represent the characters of many of the languages in the world?

Answer: Unicode - The encoding scheme that is extensive enough to represent the characters of many of the languages in the world is Unicode.

1.17: What do the terms "digital data" and "digital device" mean?

Answer: "Digital data" refers to data that is represented in a discrete, binary format (0s and 1s), while a "digital device" is any device that processes or uses digital data, such as computers, smartphones, and digital cameras.

1.18: A CPU understands instructions that are written only in what language?

Answer: A CPU understands instructions that are written only in machine language.

1.19: A program has to be copied into what type of memory each time the CPU executes it?

Answer: A program has to be copied into main memory (RAM) each time the CPU executes it.

1.20: When a CPU executes the instructions in a program, it is engaged in what process?

Answer: When a CPU executes the instructions in a program, it is engaged in the process of instruction execution or program execution.

1.21: What is assembly language?

Answer: Assembly language is a low-level programming language that is one step above machine language and uses symbolic names to represent machine language instructions.

1.22: What type of programming language allows you to create powerful and complex programs without knowing how the CPU works?

Answer: High-level programming languages allow you to create powerful and complex programs without knowing how the CPU works.

1.23: Each language has a set of rules that must be strictly followed when writing a program. What is this set of rules called?

Answer: This set of rules is called the syntax of the language.

1.24: What do you call a program that translates a high-level language program into a separate machine language program?

Answer: A program that translates a high-level language program into a separate machine language program is called a compiler.

1.25: What do you call a program that both translates and executes the instructions in a high-level language program?

Answer: A program that both translates and executes the instructions in a high-level language program is called an interpreter.

1.26: What type of mistake is usually caused by a misspelled keyword, a missing punctuation character, or the incorrect use of an operator?

Answer: This type of mistake is usually called a syntax error.

Question 1: A(n) _____ is a set of instructions that a computer follows to perform a task.

a. compiler

b. program

c. interpreter

d. programming language

Question 2: The physical devices that a computer is made of are referred to as _____.

a. hardware

b. software

c. the operating system

d. tools

Question 3: The part of a computer that runs programs is called _____.

a. RAM

b. secondary storage

c. main memory

d. the CPU

Question 4: Today, CPUs are small chips known as _____.

a. ENIACs

b. microprocessors

c. memory chips

d. operating systems

Question 5: The computer stores a program while the program is running, as well as the data that the program is working with, in _____.

a. secondary storage

b. the CPU

c. main memory

d. the microprocessor

Question 6: This is a volatile type of memory that is used only for temporary storage while a program is running.

a. RAM

b. secondary storage

c. the disk drive

d. the USB drive

Question 7: A type of memory that can hold data for long periods of time, even when there is no power to the computer, is called _____.

a. RAM

b. main memory

c. secondary storage

d. CPU storage

Question 8: A component that collects data from people or other devices and sends it to the computer is called _____.

a. an output device

b. an input device

c. a secondary storage device

d. main memory

Question 9: A video display is a(n) _____ device.

a. output

b. input

c. secondary storage

d. main memory

Question 10: A _____ is enough memory to store a letter of the alphabet or a small number.

a. byte

b. bit

c. switch

d. transistor

Question 11: A byte is made up of eight _____.

a. CPUs

b. instructions

c. variables

d. bits

Question 12: In the _____ numbering system, all numeric values are written as sequences of 0s and 1s.

a. hexadecimal

b. binary

c. octal

d. decimal

Question 13: A bit that is turned off represents the following value: _____.

a. 1

b. −1

c. 0

d. "no"

Question 14: A set of 128 numeric codes that represent the English letters, various punctuation marks, and other characters is _____.

a. binary numbering

b. ASCII

c. Unicode

d. ENIAC

Question 15: An extensive encoding scheme that can represent characters for many languages in the world is _____.

a. binary numbering

b. ASCII

c. Unicode

d. ENIAC

Question 16: Negative numbers are encoded using the _____ technique.

a. two's complement

b. floating point

c. ASCII

d. Unicode

Question 17: Real numbers are encoded using the _____ technique.

a. two's complement

b. floating point

c. ASCII

d. Unicode

Question 18: The tiny dots of color that digital images are composed of are called _____.

a. bits

b. bytes

c. color packets

d. pixels

Question 19: If you were to look at a machine language program, you would see _____.

a. Python code

b. a stream of binary numbers

c. English words

d. circuits

Question 20: In the _____ part of the fetch-decode-execute cycle, the CPU determines which operation it should perform.

a. fetch

b. decode

c. execute

d. deconstruct

Question 21: Computers can only execute programs that are written in _____.

a. Java

b. assembly language

c. machine language

d. Python

Question 22: The _____ translates an assembly language program to a machine language program.

a. assembler

b. compiler

c. translator

d. interpreter

Question 23: The words that make up a high-level programming language are called _____.

a. binary instructions

b. mnemonics

c. commands

d. keywords

Question 24: The rules that must be followed when writing a program are called _____.

a. syntax

b. punctuation

c. keywords

d. operators

Question 25: A(n) _____ program translates a high-level language program into a separate machine language program.

a. assembler

b. compiler

c. translator

d. utility

Review Questions (True or False)

Question 1: Today, CPUs are huge devices made of electrical and mechanical components such as vacuum tubes and switches.

a. True

b. False

Question 2: Main memory is also known as RAM.

a. True

b. False

Question 3: Any piece of data that is stored in a computer's memory must be stored as a binary number.

a. True

b. False

Question 4: Images, like the ones created with your digital camera, cannot be stored as binary numbers.

a. True

b. False

Question 5: Machine language is the only language that a CPU understands.

a. True

b. False

Question 6: Assembly language is considered a high-level language.

a. True

b. False

Question 7: An interpreter is a program that both translates and executes the instructions in a high level language program.

a. True

b. False

Question 8: A syntax error does not prevent a program from being compiled and executed.

a. True

b. False

Question 9: Windows, Linux, Android, iOS, and macOS are all examples of application software.

a. True

b. False

Question 10: Word processing programs, spreadsheet programs, email programs, web browsers, and games are all examples of utility programs.

a. True

b. False

Review Questions (Short Answer)

Question 1: How do the main memory and the secondary storage of a computer differ from each other?

Answer: Primary storage, also called main memory or memory, is closely associated with the CPU. Memory holds program instructions and data immediately before or after the registers. Compared with memory, secondary storage offers the advantages of nonvolatility, greater capacity, and greater economy. On a cost-per-megabyte basis, secondary storage is considerably less expensive than primary memory

Question 2: What number does a bit that is turned on represent? What number does a bit that is turned off represent?

Answer: On = 1 , Off = 0

Question 3: How many different characters can be represented in ASCII? Name the character set that addresses this limitation.

Answer: 128

Question 4: What is an individual instruction in a program written in a high-level programming language called?

Answer: Statements

Question 5: What are the short words that are used in assembly language called?

Answer: Keywords

Question 6: What is the difference between a compiler and an interpreter?

Answer: The assembler of architecture then turns the resulting program into binary code. Assembly language varies for each individual computer, depending upon its architecture.

Question 7: What type of software controls the internal operations of the computer's hardware?

Answer: Operating System