

Definition questions in 0478 are marked against fixed points, and most are worth two: the first half of the sentence earns one mark, the second half earns the other. Learn the whole sentence. Where a definition names a number (8 bits, 4 bits, 32 bits), that number is usually the mark. 定义题按固定要点给分, 整句都要背; 句中的数字往往就是得分点。

Data representation

Bit 位 — a single binary digit, 0 or 1 – the smallest unit of data a computer stores

Byte 字节 — a group of 8 bits

Hexadecimal 十六进制 — a base-16 number system using the digits 0-9 and the letters A-F, where each hex digit represents exactly 4 bits

ASCII ASCII 码 — a character set that gives each character a unique 7-bit binary code

Unicode 万国码 — a character set that gives each character a unique code, using more bits than ASCII so it can represent every language

Resolution 分辨率 — the number of pixels in an image, given as width × height

Colour depth 色彩深度 — the number of bits used to represent the colour of one pixel

Sampling rate 采样率 — the number of sound samples taken per second

Sample resolution 采样精度 — the number of bits used to store each sound sample

Compression 压缩 — reducing the size of a file so it uses less storage and takes less time to transmit

Lossy compression 有损压缩 — compression that permanently removes some data, so the original file cannot be restored exactly

Lossless compression 无损压缩 — compression that removes no data, so the original file can be restored exactly

Data transmission

Packet 数据包 — a small unit a file is split into for transmission, made up of a header, the payload and a trailer

Serial transmission 串行传输 — sending data one bit at a time down a single wire

Parallel transmission 并行传输 — sending several bits at the same time down several wires

Simplex transmission 单工传输 — transmission in one direction only

Half-duplex transmission 半双工传输 — transmission in both directions, but only one direction at a time

Full-duplex transmission 全双工传输 — transmission in both directions at the same time

Parity check 奇偶校验 — an error-detection method that counts the 1-bits and sets a parity bit so the total is odd or even as agreed

Checksum 校验和 — an error-detection method where a value calculated from the data is sent with it and recalculated on arrival; if the two differ the data is corrupt

Echo check 回送校验 — an error-detection method where the received data is sent back to the sender and compared with the original

Check digit 校验位 — an extra digit calculated from the others and placed at the end of a code, used to detect entry errors

Encryption 加密 — scrambling data using a key so that it is meaningless if intercepted

Hardware

Hardware 硬件 — the physical components of a computer system

RAM 随机存取存储器 — volatile primary memory holding the data and programs currently in use; its contents can be changed and are lost when power is off

ROM 只读存储器 — non-volatile primary memory holding data that cannot be changed, such as the start-up instructions

Volatile memory 易失性存储器 — memory whose contents are lost when power is removed

Virtual memory 虚拟内存 — secondary storage used as if it were RAM when RAM is full

Cache 高速缓存 — a small, fast memory holding frequently used instructions and data so the CPU can fetch them quickly

Register 寄存器 — a very small, very fast store inside the CPU holding one item of data

Interrupt 中断 — a signal from a device or program that causes the CPU to pause its current task and run a service routine

Microprocessor 微处理器 — a single integrated circuit containing the CPU

Embedded system 嵌入式系统 — a computer built into a larger device to carry out one dedicated task

Sensor 传感器 — an input device that measures a physical quantity continuously and sends the readings to a processor

Actuator 执行器 — an output device that converts an electrical signal into movement or another physical action

Software

Software 软件 — the programs that tell the hardware what to do

Operating system 操作系统 — system software that manages the hardware and provides an interface between the user and the computer

Utility software 实用程序 — system software that carries out a specific maintenance task, such as virus checking or defragmentation

Compiler 编译器 — a translator that converts a whole high-level program into machine code in one go, producing an executable file

Interpreter 解释器 — a translator that converts and executes a high-level program one statement at a time, stopping at the first error

Assembler 汇编器 — a translator that converts assembly language into machine code

Bootstrap 引导程序 — the small program in ROM that loads the operating system when the computer is switched on

The internet and its uses

Protocol 协议 — a set of rules that govern how data is transmitted between devices

IP address 网际协议地址 — an address given to a device by the network, which identifies it on that network and can change

MAC address 媒体访问控制地址 — a unique address given to a device by its manufacturer, which identifies the hardware and does not change

Router 路由器 — a device that sends data between networks, using IP addresses to choose the route

Cloud storage 云存储 — storing data on remote servers accessed over the internet, managed by a hosting company

Firewall 防火墙 — hardware or software that monitors traffic entering and leaving a network and blocks anything that fails its criteria

Proxy server 代理服务器 — a server that sits between a user and a web server, filtering requests and often caching pages

SSL 安全套接层 — a protocol that encrypts data sent between a browser and a web server

Malware 恶意软件 — software written to damage a computer system or steal data from it

Phishing 网络钓鱼 — sending a message that appears to be from a legitimate company to trick the user into giving personal details

Pharming 域名欺骗 — installing malicious code that redirects a user to a fake website even when they type the correct address

Denial of service attack 拒绝服务攻击 — flooding a server with requests so that it cannot respond to legitimate users

Biometrics 生物识别 — using a unique physical characteristic, such as a fingerprint or iris pattern, to identify a person

Automated and emerging technologies

Automated system 自动化系统 — a system combining sensors, a microprocessor and actuators that monitors and controls a process without human intervention

Artificial intelligence 人工智能 — computer systems that simulate human intelligence, such as learning and decision-making

Machine learning 机器学习 — a form of artificial intelligence in which a system improves its performance from data rather than from explicit programming

Algorithms and programming

Algorithm 算法 — a sequence of steps that solves a problem or completes a task

Abstraction 抽象 — removing the details that are not needed so that only what matters to the problem remains

Decomposition 分解 — breaking a problem down into smaller sub-problems that can be solved separately

Pseudocode 伪代码 — a way of writing an algorithm using English-like statements, independent of any programming language

Flowchart 流程图 — a diagram that shows an algorithm using standard symbols joined by flow lines

Trace table 追踪表 — a table with one column per variable and one row per step, used to record how values change as an algorithm runs

Variable 变量 — a named store whose value can change while the program runs

Constant 常量 — a named store whose value is set once and cannot change while the program runs

Array 数组 — a data structure holding a set of values of the same data type under one identifier, each found by its index

Selection 选择 — a construct that chooses between different sets of statements depending on a condition

Iteration 迭代 — a construct that repeats a set of statements

Subroutine 子程序 — a named block of code that performs a task and can be called from elsewhere in the program

Validation 验证 — an automatic check by the program that data is sensible and of the right form; it cannot check the data is correct

Verification 核实 — a check that data has been entered or copied accurately, by double entry or by visual comparison with the original

Linear search 线性查找 — a search that examines each item in turn from the start until the target is found or the list ends

Bubble sort 冒泡排序 — a sort that repeatedly compares adjacent items and swaps them if they are in the wrong order, until a pass makes no swaps

Databases and Boolean logic

Field 字段 — one item of data in a record, holding a single attribute

Record 记录 — a complete set of fields describing one item in a table

Primary key 主键 — a field whose value is unique for every record, used to identify that record

SQL 结构化查询语言 — a language used to search for, retrieve and manipulate data held in a database

Logic gate 逻辑门 — a circuit that takes one or more binary inputs and produces a single binary output according to a fixed rule

Truth table 真值表 — a table listing every possible combination of inputs to a logic circuit and the output each produces