A digital computer is generally made up of five distinct elements: a central processing unit, input devices, memory storage devices, output devices, and a bus. U1 A

A program is a sequence of instructions that can be executed by a computer. It can either be built into the hardware or exist independently in the form of software. U1 A

According to many historians, the true pioneers of the modem digital computer are Charles Babbage and Augusta Ada Byron. U1 A

According to the text, modern digital computers can be divided into four major categories on the basis of cost and performance. They are microcomputers,workstations,minicomputers, and mainframes. U1 A

Active research is being conducted to use promising new types of technology to make new types of computers, such as optical computers, DNA computers, neutral computers, and quantum computer. U1 A

The first electronic computers, such as Colossus and ENIAC created in Britain and the United States respectively, used vacuum tubes, which later gave place to transistors. U1 A

The microprocessor is a central processing unit on a single chip. It was made possible in the mid-l 970s with the introduction of the LSI circuit and the VLSI circuit. U1 A

The smallest unit of information handled by a computer is bit, which is the abbreviation of binary digit. A group of eight bits is called a(n) byte. U1 A

According to the text, it was the microprocessor that made possible the advent of the personal computer. U1 B

Computer science can be divided into four main fields: software development, computer architecture, human-computer interfacing, and artificial intelligence. U1 B

Computer science is said to be a highly interdisciplinary field of study because it has strong ties with many disciplines and indirect relationships with virtually all disciplines that use computers. U1 B

Computer science, which traces its roots to work done by English mathematician Charles Babbage, is a combination of theory, engineering, and experimentation. U1 B

A computer is classified as a(an) supercomputer if it is one of the fastest computers in the world when constructed. The speed of such computers is measured in petaflops. U1 C

A(n) desktop computer is the only type of personal computer that must remain plugged into an electrical source during operation. U1 C

Portable computers include laptops, tablets, and smartphones, all of which run on battery power. U1 C

Some niche devices, such as smartwatches and fitness trackers, can be classified as wearable computers. U1 C

A backdoor is also known as a(n) trapdoor. U10 A

A key threat to software is an attack on availability. U10 A

In addition to the CIA triad, two of the most commonly mentioned concepts concerning security objectives are authenticity and accountability. U10 A

In computer security, integrity covers the two related concepts of data integrity and system integrity. U10 A

In developing a security policy, a security manager must balance ease of use against security, and cost of security against cost of failure and recovery.U10 A

In the context of computer security, assurance is the degree of confidence one has that the

security measures work as intended. U10 A

Passive network security attacks attempt to learn or make use of information from the system without affecting system resources, whereas active attacks attempt to alter system resources or affect their operation. U10 A

Security concerns with respect to data encompass availability, secrecy, and integrity. U10 A

The CIA triad used to define computer security objectives consists of confidentiality,integrity, and availability. U10 A

A virus hoax usually arrives as an email alert that warns against an approaching virus attack. U10 B

Antivirus software can detect viruses by looking for signatures or by heuristic analysis. U10 B

Antivirus software produces what is referred to as a false positive when a legitimate program is mistakenly identified as a virus. U10 B

When antivirus software detects malware, it can try to remove the infection, put the file into quarantine, of simply delete the file. U10 B

A backdoor is also known as a(n) trapdoor. U10 C

A collection of bots capable of acting in a coordinated manner is referred to as a(n) botnet. U10 C

A computer virus has three parts:infection mechanism, trigger, and payload. U10 C

A rootkit is a set of programs installed on a system to maintain administrator or root to that system. U10 C

A(n) signature file created with e-mail programs can automatically put a signature at the end of each e-mail message. U11 A

An attached document retains its original formatting 或 format when it is received by the reader and can be downloaded right to his or her computer. U11 A

As used in the text, e-mail can refer both to a single electronic message and to the entire electronic system for sending and receiving messages and files over a computer network. U11 A

Because emotions are playful and informal, they are only appropriate in e-mails between close colleagues or friends and should not be used in most workplace situations. U11 A

E-mail is protected by copyright law. If you receive an e-mail from a client, you cannot immediately post it to your company's website without his or her permission. U11 A

E-mail messages should be concise. Usually, their length should be kept under one and a half screens. U11 A

Legally, e-mail messages sent by employees via the employer's computer network belong to the employer, so the employer is within his rights to read them without the employees' knowledge or permission. U11 A

When you are using e-mail, you should remember that deleted e-mail messages can be retrieved from your company's servers and used in a legal case. U11 A

An ethical decision maker should suspend or delay use of a system in the absence of a convincing case for safety, rather than to proceed in the absence of a convincing case for disaster. U11 B

Computer professionals should not only avoid international evil, but also exercise a high degree of care and follow good professional practises to reduce the likelihood of errors and other problems. U11 B

Honesty about system limitations systems is especially important for experts systems(also called

decision systems). U11 B
Most users do not understand issues of security and do not take the time to change settings, so system designers must give serious thought to default settings. U11 B
CAPTCHAs are used by a computer to ask a person to solve a short recognition task to show that he is human. U11 C
Phishing messages masquerade as originating from a trustworthy party to try to trick you into revealing sensitive information. U11 C
Social networks message boards,content sharing sites, and a host of other applications allow people to share their views with like-minded individuals. U11 C
The argument for communications not to be differentiated by their content or source or who is providing the content is known as network neutrality U11 C
An agent's learning could take the form of developing procedural knowledge (learing "how") or storing declarative knowledge (learning "what") U12 A
Artificial intelligence is being pursued along two paths, namely the engineering track and the theoretical track U12 A
Artificial intelligence is closely related with psychology, neurology, mathematics, linguistics, and electrical and mechanical engineering U12 A
Artificial intelligence seeks to build autonomous machines to carry out complex tasks without hunman intervention U12 A
DOCTOR is a(n) interactive program devoloped in the mid-1960s to project the image of a Rogerian analyst conducting a psychological interview U12 A
Most agents have sensors by which they receive data from their environments and actuators by which they can affect their environments U12 A
The performance-oriented methodology and the simulation-oriented methodology are adopted respectively for the two tracks pursued in artificial intelligence U12 A
Turing predicted that by the year 2000 machines would have a 30 percent chance of passing a five-minute Turing test U12 A
A complete AR system requires at least three components: a(n) tracking component, a registration component, and a(n) visualization component U12 B
According to Azuma, AR must have three characteristics: combining, real and virtual, interactive in real time, and registered in 3D U12 B
AR telepresence combines the benefits of live video conferencing and remote scene exploration into a natural collaborative interface U12 B
Pictofit is a virtual dressing room application which allows users to preview garments from online fashion stores on their own body U12 B
A typical wireless sensor network consists of spatially distributed autonomous sensors to cooperatively monitor physical or environmental conditions U12 C
Contemporary devices that lend support to ubiquitous computing include smartphones, tablet computers, sensor networks, RFID tags, smart cards, and GPS devicesU12 C
Supportive technologies for the IoT are divided into two categories: enabling and synergistic technologies U12 C
The architecture of an IoT consists of sensing devices connected to various applications via mobile networks, the Internet, and processing clouds U12 C
3D printing is technically called additive manufacturing, and the technology used for most

consumer-grade 3D printers is called FDM (fused deposition modeling). U2 A

A computer’s main memory is often called RAM (random access memory). U2 A

A(π) serial connection transfers only one piece of data at a time while a(n) parallel connection transfers blocks of information at the same time. U2 A

The function of computer hardware is typically divided into threemain categories. They are input, output, and storage. U2 A

The software that controls the interaction between the input andoutput hardware is called BIOS, which stands for Basic Input/Output System.U2 A

The two most common types of scanners are flatbed scanners and hand-held scanners. U2 A

The two technologies commonly used today for display devices are LCD (liquid crystal display) and LED (light-emitting diode). U2 A

Three types of mass storage systems are commonly used for personal computers: magnetic, optical, and solid state. U2 A

A modern operating system performs the task of communicating with computer users by means of a(n) graphical user interface. U2 B

In a time-sharing/multitasking system, time is divided into short segments, each of which is called a time slice. U2 B

The kernel of a typical operating system contains such software components as the file manager, various device drivers, the memory manager, the scheduler and the dispatcher.U2 B

When the total main memory space required exceeds the space actually available in the computer, the memory manager may resort to virtual memory. U2 B

The major components of the client-server model usually include aset of servers, a set of clients, and a(n) network. U2 C

The OSI reference model of network protocols is an example of the layered/abstract machine model. U2 C

The three widely used organizaional models for systems discussed in the text are the repository model, client- server model, and layered model. U2 C

There are two fundamental ways in which sub-systems making up a system exchange information: all shared data is held in a(n) central database accessible to all of them; and each maintains its own database and interchanges data with other sub-systems. U2 C

A programming language is any artificial language that can be used to write a sequence of instructions that can ultimately be processed and executed by a computer. U3 A

A(n) machine language is a low-level language in binary code that a computer can understand and execute directly. U3 A

High-level languages are commonly classified as procedure-oriented,functional , object-oriented, or logic languages. U3 A

High-level languages must first be translated into a(n) machine language before they can be understood and processed by a computer. U3 A

In an assembly language, each statement corresponds roughly to one machine language instruction. U3 A

"In procedure-oriented languages, one or more related blocks of statements that perform some complete function are grouped together
into a program module or procedure." U3 A

The history of programming languages can be traced back almost to the invention of the digital

computer in the 1940s. U3 A

We can classify programming languages into two types: low-level languages and high-level languages. U3 A

Java is an object-oriented programming language, for which classes and objects are the basis. U3 B

Java is designed to be platform-independent which makes it a useful language for programming Web applications, since users access the Web from many types of computers. U3 B

Java provides built-in language support for multithreading.That is, it allows more than one thread of execution to take place within a single program. U3 B

The Java runtime system is designed to enforce a security policy that prevents execution of malicious code. U3 B

A(n) histogram is a pictorial representation of a frequency array. U3 C

An array that consists of just rows and columns is probably a(n) two-dimensional array. U3 C

"Given the array called object with 20 elements, if you see the term object10, you know the array is in subscript form; if you see the term object[10],

you know the array is in index form." U3 C

In most programming languages, an array is a static data structure.When you define an array, the size is fixed. U3 C

A(n) compiler translates all the source code of a program written in a high-level language into object code prior to the execution of the program. U4 A

A(n) debugger is a program that is often used to help find problems in other programs. U4 A

A(n) loop is a sequence of code in a program executed repeatedly, either for a fixed nwnber of times or until a certain condition is met. U4 A

Computer programs fall into two major classes: application programs and operating systems U4 A

In the case of a(n) interpreter, a program is translated into executable form and executed one statement at a time rather than being translated completely before execution. U4 A

The modern concept of an internally stored computer program was first proposed by John von Neumann in 1945. U4 A

There are three types of application programs to translate source code into object code. They are compilers, interpreters, and assemblers U4 A

When you install a new device in a computer, you have to add the correct device driver to the operating system to allow the computer to communicate with the device. U4 A

Information engineering emphasizes a modeling tool called entity relationship diagrams. U4 B

One of the disadvantages of model-driven development is the long duration of projects. U4 B

Unlike logical models, physical models show not only what a system is or does, but also how the system is physically and technically implemented U4 B

Unlike structured analysis and design and information engineering, object-oriented analysis and design attempt to merge the data and process concerns into singular constructs called objects. U4 B

Automated testing can be divided into regression testing and exercising testing. U4 C

Black box testing is testing to specs, whereas white box testing is testing to code U4 C

Black box testing is the main technique of acceptance testing. U4 C

Testing techniques can be classified according to various criteria, including visibility, automation, partitioning, coverage and scripting, on which the discussion in the text is based. U4 C

A RESTful approach uses the http and https protocols for service communication and maps operations on the standard http verbs POST,GET,PUT, and DELETE. U5 A

A RESTful architecture is based on resources and standard operations on these resources. U5 A

Compared with the service-oriented architecture,the lightweight approach is simple,but it is less suited to services that offer complex functionality. U5 A

In service-oriented software engineering,resuable,standardized services are the basic building blocks for application systems. U5 A

Services may be classified as utility services,business services,or coordination services,and can also be thought of as task-oriented or entity-oriented. U5 A

Services may be implemented within a service-oriented architecture using a set of web service standards based on XML.These include standards for service communication， service interface definition， and service enactment in workflows. U5 A

The development of software using services is based on the idea that programs are created by composing and configuring services to create new,composite services and systems. U5 A

The service engineering process involves service candidate identification,service design,service implementation and deployment. U5 A

Automated testing can be divided into regression testing and exercising testing. U5 B

Black box testing is testing to specs, whereas white box testing is testing to code. U5 B

Black box testing is the main technique of acceptance testing. U5 B

Testing techniques can be classified according to various criteria, including visibility, automation, partitioning, coverage, and scripting, on which the discussion in the text is based. U5 B

A design pattern generally has four essential elements: the pattern name， problem, solution, and consequences. U5 C

Reusability is often a factor in object-oriented design, so the consequences of a pattern include its impact on a system's flexibility, extensibility, or portability. U5 C

The solution of a design pattern describes the elements that make up the design, their relationships, responsibilities, and collaborations.U5 C

With reusable object-oriented software, your design should be specific to the problem at hand but also general enough to address future problems and requirements. U5 C

According to the text, a DBMS is a combination of five components: hardware, software, data, users and procedures. U6 A

An important step in the design of a database involves the building of a(n) entity-relationship model that defines the entities for which some information must be maintained, the attributes of three entites, and the relationship between these entites. U6 A

As for as a DBMS is concerned, users can reger to both end users and application programs, and end users can refer to both database administrators and normal users. U6 A

Data storage traditionally used individual, unrelated files, sometimes called _flat__ files. U6 A

In the relational database model, data is organized in two-dimensinal tables called relations. U6 A

The three-level architecture for a DBMS discussed in the text consists of internal, conceptual, and

external levels. U6 A

While trying to keep the advantages of the relational model, an object-oriented database allows applications to access structured data. U6 A

A large DBMS often contains a scheduler to coordinate time-sharing among transactions in much the same way that a multiprogramming operating system coordinates interweaving of processes. U6 B

The commit point is the point at which all the steps in a transaction have been recorded in the log of the DBMS. U6 B

The items within a database that are currently being used by some transaction are marked with locks. There are two common types of locks: shared locks and exclusive locks. U6 B

With the wound-wait protocol, if an older transaction requires access to an item that is locked by a younger transaction, the younger transaction is forced to release all of its data items, and its activities are rooled back. U6 B

Data mining tasks are generally divided into two major categories, namely predictive tasks and descriptive tasks. U6 C

Predictive modeling, association cluster analysis, and anomaly detection are four of the core data mining tasks. U6 C

Scalability, high dimensionality, heterogeneous and complex data, data ownership and distribution, and non-traditional analysis are among the spcific challenges that motivated the developmentof data mining. U6 C

Traditionally viewed as a(n) intermediate process within the KDD framework, data mining now focuses on all aspects of KDD, including data preprocessing, mining, and postprocessing. U6 C

A distributed database can be classified either as a fragmented distributed databse or as a replicated distributed database. U6A

A network can also be classified according to its topology. Among the most popular topologies are the bus topology, ring topology, and star topology. U7 A

A network can also be classified as either a open network or a closed network according to whether its internal operation is based on designs in the public domain or on innovations owned and controlled by a particular entity. U7 A

According to the geographical area covered, a computer network is often classified as either a PAN, a MAN, or a WAN. U7 A

An application example of the peer-to-peer model is instant messaging in which people carry on a written conversation over the Internet U7 A

In a bus network based on the Ethernet standards, the right to transmit messages is controlled by the protocol known as CSMA/CD. U7 A

Many policies classified as CSMA/CA are standardized by IEEE within the protocols defined in IEEE 802.11 and commonly referred to as WiFi U7 A

The client-server model for interprocess communication defines the basic roles played by the processes as either a client or a server. U7 A

According to the text, although it is often used, the term peer-to-peer network is not very appropriate. U7 B

As compared with the star topology, the extended star topology adds sub-central devices instead of connecting all devices to a central unit. U7 B

In the bus topology, a terminator should be installed at each end of the bus or main cable. U7

B

The hierarchical topology, also referred to as the tree topology, is much like the star topology, except that it doesn't use a central node. U7 B

A gateway is usually a computer installed with the necessary software and allows two networks, each with a completely different set of protocols, to communicate. U7 C

A repeater is a connecting device that only regenerates the signal and does not recognize physical or logical addresses. U7 C

A truly redundant network can be created with the mesh topology. U7 C

The distinction between the two terms gateway and router is disappearing. They are now used interchangeably. U7 C

Whereas a repeater operates only in the physical layer of the OSI model, a bridge operates in both the physical layer and the data-link layer of the OSI model. U7 C

Although mnemonic addresses are convenient for humans, messages are always transferred over the Internet by means of IP addresses. U8 A

An access ISP is essentially an independent internet operated by a single authority that is in the business of supplying Internet access to individual homes and businesses. U8 A

Each domain of the Internet must be registered with ICANN. This registration process is handled by companies, called registrars, that have been assigned this role by ICANN. U8 A

ISPs are awarded blocks of consecutively numbered IP addresses by a nonprofit corporation called ICANN(the Internet Corporation for Assigned Names and Numbers). U8 A

The backbone of the Internet is composed of very high-speed, high-capacity, international WANs. U8 A

The conversion of mnemonic addresses into IP addresses is performed with the aid of name servers. U8 A

The Internet originated from research projects going back to the early 1960s, and much of the initial work in its development was sponsored by the U.S. government through DARPA(the Defense Advanced Research Projects Agency). U8 A

The process of converting IP addresses from 32-bit addresses to 128-bit addresses is currently underway. U8 A

For an outgoing message, the four layers of software involved in Internet communication work in the order of the application layer, the transport layer, the network layer, and the link layer; for an incoming message, it is just the opposite. U8 B

Only the link and network layers are involved at the intermediate stops during a packet's journey to its final destination. U8 B

The packets related to a common message may follow different paths through the Internet. U8 B

The transport layer converts long messages into segments compatible with the Internet before their transmission and reassembles them at the destination. U8 B

HTML tags are sets of instructions inserted into an HTML document to provide formatting and display information to a Web browser. U8 C

Most Web pages contain links, sometimes called hyperlinks to related documents and media files. U8 C

The main page of a Web site is sometimes called its home page. U8 C

When you use a search engine, a query includes one or more keywords and can also include

search operators. U8 C

A private cloud is built within the domain of a(n) intranet owned by a single organization. U9 A

A public cloud is built over Internet the and can be accessed by any user who has paid for the service. U9 A

A(n) hybrid cloud is built with both public and private clouds. U9 A

Generally speaking, private clouds are easier to access, and public clouds are easier to manage. U9 A

One of the design objectives for cloud computing is shifting computing from desktop to data centers. U9 A

The Internet cloud is envisioned as a massive cluster of servers,which can be physical machines or VMs. U9 A

The rapid progress in multi-core CPUs, memory chips, and disk arrays has made it possible to build faster data centers with huge amounts of storage space. U9 A

The concept of cloud computing has evolved from cluster, gid, and utility computingU9 A

From the perspective of central cloud in the core network, CloT systems can deploy FEC servers at three edge layers, namely inner-edge middle-edge, and outer-edge. U9 B

"SCALE stands for security,congnition agility, latency, and effiency, which are the five main advantages offered by FEC.

" U9 B

The capabilities of FC will enable three types of business models known as XaaS,support service, and application service. U9 B

The control mechanism supported by FEC consists of four basic types, which are deployment ,actuation,mediation, and security. U9 B

Combining aspects of mobile phones and mobile computers ,smart phones can use the Internet as well as make phone calls. U9 C

Perhaps the key driving force behind mobile,wireless application is the mobile phone. U9 C

The nodes of sensor networks may be part of familiar items such as cars or phones, or they may be small separate devices. U9 C

The sales of mobile computers have already overtaken those of desktop computers. U9 C