

Fundamentals of Computer Systems : Computer Systems  
Define a computer system

Fundamentals of Computer Systems : Computer Systems  
Describe the importance of computer systems in the modern world

Fundamentals of Computer Systems : Computer Systems  
Explain the need for reliability in computer systems

Fundamentals of Computer Systems : Computer Systems  
Explain the need for adherence to suitable professional standards in the development, use and maintenance of computer systems

Fundamentals of Computer Systems : Computer Systems  
Explain the importance of ethical, environmental and legal considerations when creating computer systems

Computing Hardware : Central Processing Unit  
State the purpose of the CPU

Computing Hardware : Central Processing Unit  
Describe the function of the CPU as fetching and executing instructions stored in memory

Computing Hardware : Central Processing Unit  
Explain how common characteristics of CPUs such as clock speed, cache size and number of cores affect their performance

Computing Hardware : Binary Logic  
Explain why data is represented in computer systems in binary form

Computing Hardware : Binary Logic  
Understand and produce simple logic diagrams using the operations NOT, AND and OR

Computing Hardware : Binary Logic  
Produce a truth table from a given logic diagram

Computing Hardware : Memory  
Describe the difference between RAM and ROM

Computing Hardware : Memory  
Explain the need for ROM in a computer system

Computing Hardware : Memory  
Describe the purpose of RAM in a computer system

Computing Hardware : Memory  
Explain the need for virtual memory

Computing Hardware : Memory  
Describe cache memory

Computing Hardware : Memory  
Describe flash memory

Computing Hardware : Memory  
Discuss how changes in memory technologies are leading to innovative computer designs

Computing Hardware : Input and Output Devices  
Understand the need for input and output devices

Computing Hardware : Input and Output Devices  
Describe suitable input devices for a wide range of computer controlled situations

<p>Computing Hardware : Input and Output Devices Describe suitable output devices for a wide range of computer controlled situations</p>	<p>Computing Hardware : Input and Output Devices Discuss input and output devices for users with specific needs</p>
<p>Computing Hardware : Secondary Storage Explain the need for secondary storage</p>	<p>Computing Hardware : Secondary Storage Describe common storage technologies such as optical, magnetic and solid state</p>

<p>Computing Hardware : Secondary Storage Select suitable storage devices and storage media for a given application and justify choice using characteristics such as capacity, speed, portability, durability and reliability</p>	<p>Computing Software : Software Explain the need for the following functions of an operating system: user interface, memory management, peripheral management, multi-tasking and security</p>
<p>Computing Software : Software Describe the purpose and use of common utility programs for computer security (anti-virus, spyware protection and firewalls)</p>	<p>Computing Software : Software Describe the purpose and use of common utility programs for disk organisation (formatting, file transfer and defragmentation)</p>

<p>Computing Software : Software Describe the purpose and use of common utility programs for system maintenance (system information and diagnosis, system clean up tools, automatic updating)</p>	<p>Computing Software : Software Discuss the relative merits of custom written, off the shelf, open source and proprietary software</p>
<p>Data Representation : Units Define the terms bit, nibble, byte, kilobyte, megabyte, gigabyte and terabyte</p>	<p>Data Representation : Units Understand that data needs to be converted into a binary format to be processed by a computer</p>

Data Representation : Number  
Convert positive denary whole numbers (0-255) into 8-bit binary numbers and vice versa

Data Representation : Number  
Add two 8-bit binary integers and explain overflow errors which may occur

Data Representation : Number  
Convert positive denary whole numbers (0-255) into 2-digit hexadecimal numbers and vice versa

Data Representation : Number  
Convert between binary and hexadecimal equivalents of the same number

Data Representation : Number  
Explain the use of hexadecimal numbers to represent binary numbers

Data Representation : Character  
Explain the use of binary codes to represent characters

Data Representation : Character  
Explain the term character set

Data Representation : Character  
Describe with examples (for example ASCII and Unicode) the relationship between the number of bits per character in a character set and the number of characters which can be represented

Data Representation : Images  
Explain the representation of an image as a series of pixels represented in binary

Data Representation : Images  
Explain the need for metadata to be included in the file such as height, width and colour depth

Data Representation : Images  
Discuss the effect of colour depth and resolution on the size of a file

Data Representation : Sound  
Explain how sound can be sampled and stored in digital form

Data Representation : Sound  
Explain how sampling intervals and other considerations affect the size of a sound file and quality of its playback

Data Representation : Instructions  
Explain how instructions are coded as bit patterns

Data Representation : Instructions  
Explain how the computer distinguishes between instructions and data

Databases : The Database Concept  
Describe a database as a persistent organised store of data

Databases : The Database Concept  
Explain the use of data handling software to create, maintain and interrogate a database

Databases : The DBMS  
Describe how a DBMS allows the separation of data from applications and why this is desirable

Databases : The DBMS  
Describe the principal features of a DBMS and how they can be used to create customised data handling applications

Databases : Relational Databases  
Understand the relationship between entities and tables

Databases : Relational Databases  
Understand the components of a relational database, such as tables, forms, queries, reports and modules

Databases : Relational Databases  
Understand the use of logical operators in framing database queries

Databases : Relational Databases  
Explain the use of key fields to connect tables and avoid data redundancy

Databases : Relational Databases  
Describe methods of validating data as it is input

Network Communication : Networks  
Explain the advantages of networking stand-alone computers into a local area network

Network Communication : Networks  
Describe the hardware needed to connect stand alone computers to a local area network, including hub/switches, wireless access points

Network Communication : Networks  
Explain the different roles of computers in a client-server and a peer-to-peer network

Network Communication : Networks  
Describe, using diagrams or otherwise, the ring, bus and star network topologies

Network Communication : Networks  
Describe the differences between a local area network and a wide area network such as the internet

Network Communication : Networks  
Explain the terms IP addressing, MAC addressing, packet and protocols

Network Communication : Networks  
Explain the need for security measures in networks, such as user access levels, suitable passwords and encryption techniques

Network Communication : Networks  
Describe and justify network policies such as acceptable use, disaster recovery, failover, backup and archiving

Network Communication : The Internet  
Describe the nature of the internet as a worldwide collection of computer networks

Network Communication : The Internet  
Describe the hardware needed to connect to the internet including modems and routers

Network Communication : The Internet  
Explain the need for IP addressing or resources on the internet and how this can be facilitated by the role of DNS services

Network Communication : The Internet  
Explain the importance of HTML and its derivatives as a standard for the creation of web pages

Network Communication : The Internet  
Describe common file standards associated with the internet such as JPG, GIF, PDF, MP3 and MPEG

Network Communication : The Internet  
Explain the importance of compressing files that are transmitted via the internet

Network Communication : The Internet  
Describe the differences between lossy and lossless compression

Programming : Algorithms  
Understand algorithms (written in pseudocode or flow diagrams), explain what they do and correct or complete them

<p>Programming : Algorithms Produce algorithms in pseudocode or flow diagrams to solve problems</p>	<p>Programming : Programming Languages Explain the difference between high level code and machine code</p>
<p>Programming : Programming Languages Explain the need for translators to convert high level code to machine code</p>	<p>Programming : Programming Languages Describe the characteristics of an assembler, compiler and an interpreter</p>

Programming : Programming Languages  
Describe common tools and facilities available in an integrated development environment (IDE): editors, error diagnostics, run-time environment, translators, auto-documentation

Programming : Control Flow in imperative languages  
Understand and use sequence in an algorithm

Programming : Control Flow in imperative languages  
Understand and use selection in an algorithm (IF and CASE statements)

Programming : Control Flow in imperative languages  
Understand and use iteration in an algorithms (FOR, WHILE and REPEAT loops)

Programming : Handling Data in algorithms  
Define the terms variable and constant as user in an imperative language

Programming : Handling Data in algorithms  
Use variables and constants

Programming : Handling Data in algorithms  
Describe the data types integer, real, Boolean, character and string

Programming : Handling Data in algorithms  
Select and justify appropriate data types for a given program

Programming : Handling Data in algorithms  
Perform common operations on numeric and Boolean data

Programming : Handling Data in algorithms  
Use one-dimensional arrays

Programming : Testing  
Describe syntax errors and logic errors which may occur while developing a program

Programming : Testing  
Understand and identify syntax and logic errors

Programming : Testing  
Select and justify test data for a program, stating the expected outcome of each test


