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| Computer Systems Revision– Use the table provided to create notes |
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| Data representation |
| Representation of positive numbers in binary  including place values and range up to and including 32 bits |  |
| Conversion from binary  to  decimal and vice versa |  |
| Description of the representation of negative numbers  using two’s complement using examples  of up to 8 bit  numbers |  |
| Description of the relationship between the number of bits assigned to the mantissa/exponent and the range and  precision of floating point  numbers |  |
| Conversion to  and from  bit, byte, Kilobyte, Megabyte, Gigabyte, Terabyte. (Kb, Mb, Gb,  T b ) |  |
| Description of  Unicode and its advantages over ASCII |  |
| Description of the bit map  method of graphic representation using  examples of colour/grey scale bit maps |  |
| Description of  the relationship of  bit depth to  the number of colours using exam ples up to and including  24 bit depth  (true colour) |  |
| Description of the vector graphics  method of graphic representation |  |
| Description of  the relative advantages and disadvantages of bit mapped and  vector graphics |  |
| Description of  the relationship between the bit depth  and file size |  |
| Explanation of  the need for data compression using  the storage of bitmap graphic files, as examples |  |
|  |  |
| Computer structure |
| Detailed description of the purpose of the ALU and control unit |  |
| Description of the purposes of registers: |  |
| * to hold data being processed
 |  |
| * instructions being executed
 |  |
| * addresses to be accessed
 |  |
| Description of the function of the data bus and the address bus |  |
| Description of the read, write and timing functions of the control lines |  |
| Identification of other control lines, including reset and interrupt lines |  |
| Simple description, referring to the appropriate buses and control lines, of the steps in the fetch-execute cycle |  |
| Description of the following elements of computer memory : registers, cache, main  memory, backing storage |  |
| Distinction between the above elements of memory according to function and speed of access |  |
| The concept of addressability |  |
| Description and evaluation of the following measures  of performance: |  |
| * clock speed
 |  |
| * MIPS
 |  |
| * FLOPS
 |  |
| application based tests |  |
| Description of the effect the following factors have on system performance: |  |
| * data bus width
 |  |
| * use of cache memory
 |  |
| * rate of data transfer to and from peripherals
 |  |
| Description of current trends in computer hardware, including |  |
| * increasing clock speeds
 |  |
| * increasing memory
 |  |
| * backing storage capacity
 |  |
|  |  |
| Peripherals |
| Description of  the use and advantages of buffers and spooling |  |
| Description of a suitable selection of hardware,  including peripherals, to support typical tasks including |  |
| * production  of a  multimedia catalogue
 |  |
| * setting up a LAN in a school
 |  |
| * development of a school website
 |  |
| Justification of the hardware selected in terms of  appropriate characteristics including |  |
| * resolution
 |  |
| * capacity
 |  |
| * speed
 |  |
| * cost
 |  |
| * compatibility
 |  |
| Description of the features,  uses and advantages  of solid state storage devices including flash cards |  |
| Description of the development trends in backing storage devices |  |
| Description of the following functions of an interface: |  |
| * buffering
 |  |
| * data format conversion (serial to parallel)
 |  |
| * data format conversion (analogue to  digital)
 |  |
| * voltage  conversion
 |  |
| * protocol  conversion
 |  |
| * handling of status signals
 |  |
| Distinction between parallel and serial interfaces |  |
| Description and explanation of the current trends towards increasing  interface speeds and wireless communication between peripherals and CPU |  |
|  |  |
| Networking |
| Comparison of LANs, WANs, Intranet and Internet  work in terms  of |  |
| * transmission media
 |  |
| * bandwidth
 |  |
| * geographical spread
 |  |
| * functions
 |  |
| Distinction between a  main frame with terminals and  a network of computers |  |
| Descriptive comparison of peer-to-peer networks and client server  networks |  |
| Description of  the functions of file, print and web servers |  |
| Description of  a node and  a channel |  |
| Description of  bus, star, ring  and mesh topologies using the terms node and channel |  |
| Description of the consequences for each of the above topologies of node and channel failure |  |
| Simple description  of the functions  and  uses of a hub, switch and router |  |
| Identification of the need for a network interface card (NIC) |  |
| Description and explanation of the trends towards higher bandwidth and wireless communications |  |
| Description of the following technical reasons  for the increasingly  widespread use of networks: |  |
| * advances in computer hardware
 |  |
| * including processors
 |  |
| * main memory  capacity
 |  |
| * backing  storage
 |  |
| * data transfer rates
 |  |
| * improved network related software, including
 |  |
| * + browsers
 |  |
| * + network operating systems
 |  |
| Description of the misuse of networks for the following illegal purposes: |  |
| * breaching copyright
 |  |
| * hacking
 |  |
| * planting viruses
 |  |
| Description of  the application of the following to the misuse of networks |  |
| * the Computer Misuse Act
 |  |
| * the Copy right  Designs and Patents Act
 |  |
| * the Data Protection Act
 |  |
|  |  |
| Computer software |
| Description of the function of a bootstrap loader |  |
| Description and exemplification of the main functions of a single user operating system : |  |
| * interpreting users commands,
 |  |
| * file management,
 |  |
| * memory  management,
 |  |
| * input/output management,
 |  |
| * resource allocation,
 |  |
| * managing processes
 |  |
| Definition of a utility  program |  |
| Description of utility  programs including: |  |
| * virus checker
 |  |
| * disk editor
 |  |
| * defragmenter
 |  |
| Description of the standard file formats for graphics files: |  |
| * jpeg
 |  |
| * gif
 |  |
| * TIFF
 |  |
| Description of  a suitable selection of software to support typical tasks including: |  |
| * production of  a multimedia catalogue
 |  |
| * setting up a LAN in a school
 |  |
| * development of a school website
 |  |
| Description and exemplification of software compatibility  issues |  |
| * including memory and storage requirements
 |  |
| * OS compatibility
 |  |
| Classification of viruses by type of file infected: |  |
| * file virus
 |  |
| * boot  sector virus
 |  |
| * macro virus
 |  |
| Description of  the following  virus code actions : |  |
| * replication
 |  |
| * camouflage
 |  |
| * watching
 |  |
| * delivery
 |  |
| Distinction between |  |
| * a virus
 |  |
| * a worm
 |  |
| * a Trojan horse
 |  |
| Description of anti-virus software detection techniques: |  |
| * use of checksum
 |  |
| * searching for virus signature
 |  |
| * heuristic detection
 |  |
| * memory  resident monitoring
 |  |