**COMPUTER SYSTEMS**

| QUESTION | TYPICAL ANSWER |
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| What is Machine Code?<br><br>The program is written in a high level language but the computer only understands machine code. What needs to happen to the program to allow it to be used on a computer? | • The language that the computer understands<br>• Made up of binary numbers 0s and 1s<br>• Difficult to read, write and understand<br>• Easy to make mistakes when programming<br><br>• Translated<br>• Compiled<br>• Interpreted<br>• changed to machine code |
| What characters are used in machine code? | • 1 and 0<br>• **must have both**<br>• **Not acceptable – binary** |
| What is a High Level Language? | • Made up of instructions similar to English words<br>• Easier to write, read and understand |
| Explain why it is necessary for high level languages to be translated. | o The computer only understands machine code not high level languages.<br>o So the computer can understand |
| What is a program file? | o A program is a list of instructions that tell the computer what to do. |
| What is a data file? | o A file created by a program eg a document created in a word processing program |
| What is a translator? | A type of program - all programs written in a HLL need to be translated into machine code before they can be run |
| Types of translator | • Compiler<br>o Advantages<br>▪ Translates the whole program at once<br>▪ Machine code stored and can be run when required<br>▪ Much faster than Interpreted program<br>o Disadvantage<br>▪ Errors not spotted until programmer has finished<br>▪ Can slow down process of writing software<br>▪ More difficult to learn to program using a compiled language |

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| | • Interpreter<br>  o Translates each line of program as it is run<br>  o Sends a message if there is an error<br>  o<br>  o Helpful when learning to write programs as errors detected and corrected immediately<br>• Disadvantage<br>  o Slower to run than a compiled program |
| Which type of translator would you use while developing the program: | o Interpreter tells you when errors have been made as soon as entered |
| When the program is finished: | o Compiler because:<br>o object code produced<br>o saved as machine code<br>o requires no further translation<br>o (finished program) will run faster |
| Portability of software | Software can be run on other makes of machine with little or no adjustment. |
| Derek always tries to make sure his software is portable. Explain why he does this. | o Can run on lots of different types of systems/platforms<br>o increase profits<br>o will be bought by more clients |
| The server has a processor, containing a control unit, ALU and registers. What is the function of the ALU? | o Perform arithmetic calculations<br>o make decisions |
| What is the function of the registers? | o Act as temporary memory<br>o storage locations to hold data |
| Explain how the computer stores a black and white image in memory. | o Each pixel is represented by a bit<br>o use 1 for black and 0 for white |
| What is an Operating System? | Software that controls the basic operation of a computer, main functions are:<br><br>• File management<br>• Provides an HCI for the user<br>• Memory management<br>• Error reporting<br>• Checks input/output devices<br>• Controls security of the system |

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| Translator programs are an example of systems software. State one other example of systems software. | • operating system<br>• utility programs eg device drivers, anti-virus software, disk defragmenters, etc. 1 |
| Interactive systems | Computer responds directly to commands – time taken to respond is not critical eg playing a game of chess with a computer |
| Real-time systems | • Speed of response is vital<br>• Computer responds immediately to commands |
| Background job | • Using the processor's time efficiently – eg creating a word document whilst printing another document |
| Device driver | Allows the computer to operate a device attached to it – has the codes to make the device work |
| Printer driver | Takes the codes used in a document and translates them into the appropriate code for the type of printer in use |
| Filing systems | • Program file – a list of instructions that tell the computer what to do<br>• Data file – a file created by a program eg a text document created by the program Word |
| Hierarchical filing system | Advantages<br>• Can group related files together<br>• Easy to see files in a single directory<br>• Folders can have the same name |
| Central Processing Unit | Made up of three parts<br>• Control Unit<br>o makes the computer carry out instructions of a program in the right order<br>o controls the other parts of the processor<br>• Airthmetic/logic Unit<br>o Does all the calculating<br>o Performs the logical operations makes decisions<br>• Registers<br>o Memory locations inside the processor<br>o Used to hold programs an data while being processed |
| How is data stored? | As binary digits 0s and 1s<br>Each character, space or symbol is a bit<br>8 bits in a byte<br>1024 bytes in a kilobyte etc |

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| What is a character set? | A list of all the characters which a computer can process and store (produced by a keyboard) |
| Representing Graphics | • Pictures made up of tiny dots called pixels<br>• The larger the number of pixels the higher the resolution and better picture<br>• The lower the number of pixels the lower the resolution and not so good picture |
| What is a storage location | • A place in the computers memory with it's own unique address |