

GCE



CCEA GCE AS
Exemplifying Examination
Performance

Digital Technology

This is an exemplification of candidates' performance in GCE AS examinations (Summer 2017) to support the teaching and learning of the Digital Technology specification.



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EXEMPLIFYING EXAMINATION PERFORMANCE

GCE Digital Technology

Introduction

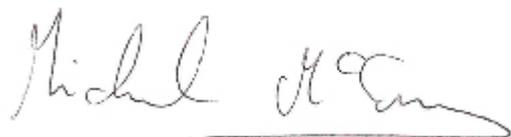
These materials illustrate aspects of performance from the 2017 summer AS examination series of CCEA's revised GCE Specification in 2016.

Students' grade A responses are reproduced verbatim and are accompanied by commentaries written by senior examiners. The commentaries draw attention to the strengths of the students' responses and indicate, where appropriate, deficiencies and how improvements could be made.

It is intended that the materials should provide a benchmark of candidate performance and help teachers and students to raise standards.

For further details of our support package, please visit our website at www.ccea.org.uk

Best wishes



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GCE: AS Digital Technology

AS1: Approaches to System Development

Grade: A Exemplar

Q1 A computer system can be developed in a number of ways.

Q1a Briefly compare the waterfall model and the agile approaches to system development. [5]

Student's response

The waterfall model consists of a sequence of distinct stages (for example analysis and testing). Each stage must be completed before the next can commence. Furthermore, if an error is found during any stage, an earlier stage may have to be repeated. This after leads, to the system being developed overtime and over budget, thus contributing to the software crises. In agile, however, the system is developed during sprints. These sprints often last a week or so in length, and during a sprint the system is tested. This causes the system to be developed within the deadline and budget. Furthermore, in agile, there is constant feedback with the end user, so the user requirements are clear, whereas in the water-full modell the only time the end user is involved is during the analysis and implementation stages, therefore it does not incorporate a change in user requirements.

Examiner's comments

The candidate's description of the waterfall model was more accurate and detailed than the description of the agile approach which lacked depth. The candidate made a superficial distinction between the two approaches but there was no proper distinction made between the two, nor a consideration of when each approach might be preferred.

The candidate's response was assessed as a Band 0 response and [2] out of [5] marks were awarded.

Q1b Explain what is meant by each of the following in the context of a software project. [4]

A constraint

Student's response

A constraint is any restriction that defines a project's limitation. RG. The scope, is what the project is expected to accomplish in terms of goals and deliverables.

A risk

Student's response

A risk in project management is something that threatens the completion of the project. The project manager should carry out risk management regularly. EG.. Project running over budget/time.

Examiner's comments

The candidate stated that a constraint is a restriction on a software project but provided no further detail and was awarded [1] out of [2] marks. The candidate gave a relevant example of a risk to a software project but the reference to the 'completion of a project' did not indicate the possible impact on the project's success e.g. it might fail to meet its objectives. [1] out of the [2] marks was awarded.

One of the responsibilities of a project manager is to allocate resources. [3]

Q1c Identify three resources which will be allocated.

Student's response

1 hardware

2 software

3 persennel

Examiner's comments

The candidate correctly identified three appropriate resources allocated by a project manager and was awarded [3] out of [3].

Q1d Identify two other responsibilities of a project manager. [2]

Student's response

1 Manages the budget

2 identifies and responds to risk

Examiner's comments

The candidate correctly identified two additional responsibilities of a project manager and was awarded [2] out of [2].

A large software project involves a team of programmers using technical documentation to develop code. [4]

Q1e Identify four components of technical documentation.

Student's response

1 DFDs/ERDs

2 Test plans

3 Storyboarding

4 Requirements Specification

Examiner's comments

The candidate correctly identified three components of technical documentation - design components (e.g. DFDs/ERDs), test plans and the requirements. The candidate also identified storyboarding but this is also a design component so [3] out of the [4] marks were awarded.

Q1f Describe the importance of version management during system development. [4]

Student's response

Version management is the documentation of any changes made to the system, when they were changed, who changed it and their reasoning. This is important so that any changes can easily be reversed if found at a later stage as it can be traced. It also ensures all developers are working on the same version of the software. If any errors occur the person who wrote than section of code can be identified and made use of to fix it.

Examiner's comments

The candidate provided an almost complete description of the importance of version management of software during system development. The candidate understood that system developers must be working on the same version of software, that any changes must be documented, and that these must changes be documented in such a way that they can be reversed if necessary. The candidate was awarded [3] out of [4]. For the additional mark the candidate could have described how version numbers assist tracking of changes to software or that all previous versions of documentation should be saved.

Q2a Describe how each of the following can be used to design the user interface. [6]

Prototyping

Student's response

Prototyping is the production of a simple version of the program, used during the design phase to identify the user requirements. The user interacts with the prototype and reports feedback to the developer on changes they want implemented. The prototype does not process any data but has a working user interface.

Storyboarding

Student's response

A storyboard is a diagram showing the planned sequence of screen displays for a website. Can be linear or branching. Each diagram will represent a page with a user interface. This will include the inputs and outputs and the different navigational paths available to the user.

Examiner's comments

The candidate did not describe the general nature of a prototype - 'a simple version' is an inadequate description at this level. However, the candidate made valid points about the user providing feedback to the developer and that the prototype did not process any data. The last point made by the candidate contradicted the stem of the question but was not penalised. [2] out of [3] marks were awarded.

The candidate's description of the use of storyboarding was excellent and showed good use of DT terminology. [3] out of [3] were awarded.

Q2b A test plan is produced for a new computer system. Identify four components you would expect to find in a test plan. [4]

Student's response

1 The module being tested

2 The test data

3 The expect result of the test

4 The actual result of the test

Examiner's comments

The candidate correctly identified three components of a test plan. The fourth component - the actual result of the test - would not be part of a test plan. [3] out of [4] were awarded.

Q2c A business which uses a computerised information system has implemented a disaster recovery plan.

Q2c(i) Explain why the business needs a disaster recovery plan. [4]

Student's response

A disaster recovery plan will specify how an organisation will continue to function during a natural or human-induced disaster. It will identify critical data, key personnel and offer an alternative location where the organization can continue to operate until the disaster has ended. It is essential to the survival of large businesses when affected by a disaster.

Examiner's comments

The candidate provided a clear and very focused explanation of the need for a disaster recovery plan and made excellent use of the correct DT terminology. [4] out of [4] were awarded.

Q2c(ii) State the main difference between a differential backup and an incremental backup. [2]

Student's response

A differential backup backs-up all editer files since the last full backup, however, an incremental backup backs-up all changed files since the last full backup OR last incremental backup.

Examiner's comments

The candidate was familiar with differential and incremental backups and articulated the difference between them accurately yet succinctly, with excellent use of the correct DT terminology. [2] out of [2] were awarded.

Q3a One reason for the 'software crisis' was that many software systems were delivered over budget.

Identify three other reasons that caused the 'software crisis'. [3]

Student's response

1 The development of the system ran over schedule

2 User's requirements weren't being met

3 Effective advances in hardware and software weren't being used in the production of the new system.

Examiner's comments

The candidate was clearly familiar with the causes of the 'software crisis' and correctly identified three causes as required. The candidate's use of the appropriate DT terminology was excellent. [3] out of [3] were awarded.

Q3b A stock control system is required for a large and busy warehouse in which heavy equipment is located and retrieved.

The systems analyst decides to use document sampling instead of observation as the fact-finding method.

Evaluate the analyst's choice of fact-finding method. [8]

Student's response

Document sampling is when the analyst analyses samples of documents, usually reports and receipts to gain a knowledge of how data is input, collated, processed and stored. They are also made aware of the volume of data that moves through the system. This allows them to understand how the organisation works. However it is very time consuming especially if there are large volumes of documents. On the other hand observation would have the benefit of seeing how long processes actually take and the capabilities of the employee, however they may behave differently as they are being watched. Observation in this circumstance would be very difficult to carry out as the warehouse is large and there would be health and safety training and restraints which would make it more difficult to carry out. Document sampling would be more appropriate to give the analyst more knowledge on the stock control as they would have accessed to required forms, reports and receipts.

Examiner's comments

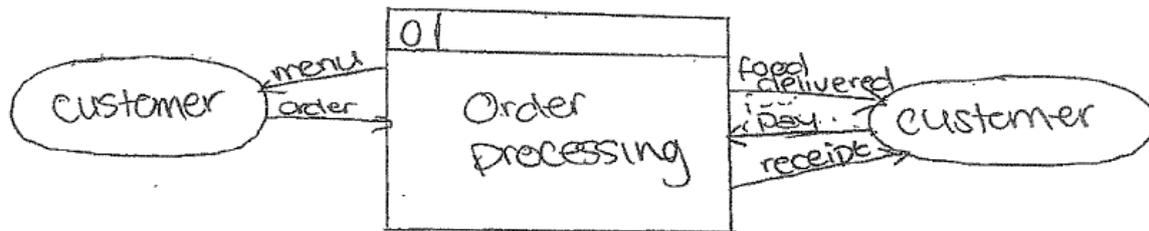
The candidate referred to document sampling and gave appropriate examples of the documentation which would be sampled, as well as the purpose of the sampling. Observation was referred to but the nature of observation in this context was not adequately explained. Who would be observed? What form would the observation take? The candidate correctly identified the risks involved in observation in the warehouse as described in the question stem. The benefits of document sampling were referred to, but in a manner which lacked the required depth.

The candidate's response was assessed as a Band 1 response and [5] out of [8] marks were awarded.

Q3c A fish and chip shop distributes its menu to customers. Customers can order food by telephone. The food is delivered to the customer's home. Customers pay and receive a receipt.

Q3c(i) Produce a context data flow diagram (DFD) for this system. [6]

Student's response



Examiner's comments

The candidate produced an almost complete context data flow diagram. The name of the process was not considered to have the appropriate context. [5] out of [6] were awarded.

Q3c(ii) Explain how a level 1 DFD could be produced from a context level DFD. [4]

Student's response

The single process could be divided into further sub-processes until you reach the pseudo-code. Data stores could be added to show where data is held. More external entities could be added to more accurately show how the data flows through the system.

Examiner's comments

The candidate was familiar with the process of refining a context level DFD and produced a very good response which correctly identified the identification of sub-processes, data stores and data flows. [3] out of [4] were awarded.

Q4 An organisation with a number of offices throughout the country introduced a computerised stock control system.

Q4a Different changeover methods were considered for the implementation of the system.

Q4a(i) Explain how a system is implemented using direct changeover, and state one advantage and one disadvantage of this method. [4]

Explanation

Student's response

The system is implemented all at once. This usually done over a quiet processing period e.g. overnight. After the new system is implemented, the old system is discarded.

Advantage

Student's response

Running costs are lower for the business as there will not be multiple systems operating at once.

Disadvantage

Student's response

If the new system fails, the old system is not available to revert back to as it has been discarded.

Examiner's comments

The candidate was properly familiar with the direct changeover method. The explanation was accurate and concise, the advantage addressed the duplication of resources, and the disadvantage identified the risk from the new system failing. [4] out of [4] were awarded.

Q4a(ii) The system was implemented using the pilot method. Evaluate the organisation's choice of changeover method. [6]

Student's response

The pilot method only implements the new system into one branch of the business, whilst the rest of the business continue to use the old system until the newer system has been proven to operate. This means that if the system fails only one branch will be affected. There will also be low running costs as there will not be multiple systems operating at once. However, data transfer and communication on the new system in this brand may not be compatible with the old system, meaning it cannot interact with the rest of the business using the old system, and the pilot method will present the staff of this brand with extra work as they train to use the new system.

Examiner's comments

The candidate accurately described some of the key features of the pilot method of changeover and referred appropriately to the structure of the organisation. However, the candidate makes a simplistic reference to costs. In addition, the candidate referred to compatibility issues which would be a factor whatever the changeover method.

The candidate's response was assessed as a Band 1 response and [4] out of [6] marks were awarded.

Q4b Explain what data conversion was required if the computerised system replaced a manual system. [4]

Student's response

In order to be compatible with the new computerised system manual data will have to be converted into digital format to be incorporated into the new system this will require the paper-based data being transferred to the new system by means of typing. This process will be very tedious and will present the staff who will enter this data into the new system with extra work.

Examiner's comments

In general, candidates were not familiar with the process of data conversion.

The candidate referred to the need for data to be keyed but no other relevant detail was provided. [1] out of [4] was awarded.

Q4c The system requires adaptive maintenance.

Q4c(i) Identify two other types of software maintenance. [2]

Student's response

1 Perfective maintenance

2 Corrective maintenance

Examiner's comments

The candidate correctly identified two types of software maintenance. [2] out of [2] were awarded.

Q4c(ii) Explain what is meant by adaptive maintenance. [3]

Student's response

This refers to any action taken after the initial delivery of a system in response to a change in environment or changing user's requirements. The system may need to be adapted to include new functions or current functions adapted to ensure that the system still meets the user's requirements.

Examiner's comments

The candidate was familiar with adaptive maintenance but did not provide all the required detail, other than to refer to a change in environment and the addition of new functions. [2] out of [3] were awarded.

Q5 An Integrated Development Environment (IDE) includes the facility to translate programs.

Q5a List four other facilities provided by an IDE. [4]

Student's response

1 De-bugger

2 Line-numbering

3 Code-editor

4 GUI builder

Examiner's comments

The candidate correctly identified four additional facilities provided by an Integrated Development Environment. [4] out of [4] were awarded.

Q5b Explain why a program might need to be translated. [4]

Student's response

A program may be written in high level language which can be understood by humans but not by a computer. The code is translated into machine code which the computer can then understand and the instructions executed. Ultimately an executable file is produced (.exe)

Examiner's comments

The candidate's explanation of why a program might need translation was accurate, complete and concise. It demonstrated excellent use of the appropriate DT terminology and [4] out of [4] were awarded.

Q5c Explain what is meant by a condition-controlled loop. [4]

Student's response

A condition – controlled loop is a loop which will repeat until a condition is met. The loop with either repeat until the condition is true which means the condition is tested at the end of the loop or while the condition is true which means the condition is tested at the start of the loop. A condition controlled loop can repeat any number of times and therefore the condition controlled loop is used when you don't know in advance how many times the loop will have to be repeated.

Examiner's comments

The candidate's explanation of a condition-controlled loop was accurate well presented. It demonstrated good use of the appropriate DT terminology and [4] out of [4] were awarded.

The following algorithm is meant to output the sum of the first 10 odd numbers.

```
begin  
  set count to 1  
  set sum to 0  
  repeat  
    add count to sum  
    add 2 to count  
  until count > 10  
  output sum  
end
```

Q5d Discuss the algorithm's effectiveness and suggest how it could be amended. [6]

Student's response

This algorithm will not produce the correct result as it will only give the sum of the odd numbers from 1 to 10 so the algorithm isn't effective. To make the algorithm correctly output the sum of the first 10 odd numbers you change the until count > 10 to count > 20 or you could use a count-controlled loop which you will set to repeat 10 times, set the starting variable as 1 and ensured the variable increments by 2 each time.

Examiner's comments

The candidate identified the error in the algorithm but did not address the cause of this error. The candidate suggested a suitable correction using some appropriate DT terminology.

The candidate's response was assessed as a Band 1 response and [4] out of [6] marks were awarded.

Q5e Explain inheritance as used in object-oriented programming. [4]

Student's response

Inheritance is were a new class can inherit the properties of an existing class. The new class is called the derived class and the existing class is called the base class. The derived class will have all the same properties and methods of the base class but new ones can also be added. This saves time during testing as if a derived class works correctly then it can also be assumed that the base class will work correctly which means focus can be put on the new properties and methods of the derived class.

Examiner's comments

The candidate was appropriately familiar with inheritance as used in object-oriented programming. The response was almost complete and made excellent use of DT terminology. [3] out of [4] were awarded. To gain the final mark the candidate should have referred to the a point that derived classes can have inherited methods over-written as well as additional methods.

GCE: AS Digital Technology

AS2: Fundamentals of Digital Technology

Grade: A Exemplar

Q1a(i) How many bytes are there in each of the following? [2]

A megabyte

Student's response

1024 Kilobytes = 2^{20} bytes

1024^2 bytes (1024 × 1024)

A terabyte

Student's response

1024 gigabytes

1024^4 bytes (1024 × 1024 × 1024 × 1024)

Examiner's comments

The candidate stated the number of bytes in each case accurately using the appropriate index notation. [2] out of [2] marks were awarded.

Q1a(ii) A file requires 4 megabytes of storage. How many files of this size could be held in a gigabyte? You must show your work. [3]

Student's response

4 megabytes , 1024 MB in 1 GB

$$\begin{array}{r} 0 \ 2 \ 5 \ 6 \\ 4 \ \overline{) 1^1 0^2 2^2 4} \end{array} = 256 \text{ files}$$

Examiner's comments

The candidate correctly calculated the number of files which could be held. The working out was clearly laid out and well annotated. [3] out of [3] marks were awarded.

Q1b The two's complement system can be used to represent positive and negative numbers.

Q1b(i) Describe how negative numbers are represented in two's complement using 8 bits. [2]

Student's response

Negative numbers are represented by finding the binary of the positive value i.e. -64 inventing the binary number and adding 1. A 1 at the first digit represents a negative number so when working out the decimal, a one at the first position would equal -128.

Examiner's comments

The candidate correctly referred to the process of inverting the binary equivalent of the corresponding positive value but did not explain exactly how a 1 is added. Candidates were expected to identify the least significant bit. [1] out of [2] marks was awarded.

Q1b(ii) Show how the decimal number -64 can be represented as a two's complement binary number using 8 bits. [3]

Student's response

	128	64	32	16	8	4	2	1
64:	0	1	0	0	0	0	0	0
Invert:	1	0	1	1	1	1	1	1
Add 1:		1	1	1	1	1	1	1
-64:	1	1	0	0	0	0	0	0

Examiner's comments

The candidate showed clearly how the given decimal number can be represented as a two's complement binary number using 8 bits. The steps were shown and clearly annotated. [3] marks out of [3] were awarded.

Q1c Compare the way in which characters are represented in ASCII and Unicode. [5]

Student's response

ASCII (American Standard Code for Information Interchange) uses a 7 bit code to store characters and can represent up to 128 characters (96 displayable characters and 32 control characters). However it is usual for ASCII to store characters using 8 bits and the 8th bit can be used as a parity bit, for error checking. Unicode is a character set which incorporates characters from various languages. It uses 2 bytes (16 bits) to store each character and therefore has an increased capacity of 2^8 over ASCII. With the ability to represent 65536 characters.

Examiner's comments

The candidate referred correctly to the number of bits used by each system, as well as the number of characters each system could represent. There was a valid comparison between the two systems and appropriate use was made of relevant DT terminology.

The candidate's response was assessed as a Band 2 response and [5] out of [5] marks were awarded.

Q2a Describe each of these methods of data validation. [4]

Length check

Student's response

A length check ensures that the data entered is a certain number of characters long e.g. a telephone number must contain 11 digits.

Format check

Student's response

A format check ensures that data is of the correct format e.g. In a post code that it follows the format LL NN LL

Examiner's comments

In their description of a length check the candidate correctly referred to the restriction on the number of characters. [2] out of [2] marks were awarded. However, in their description of a format check the candidate did not use the appropriate DT terminology [0] marks were awarded.

A retailer sells a range of products using its website.
Part of the data entry form used to place an order is shown in the diagram below.

Surname	<input type="text"/>
Email	<input type="text"/> *
Confirm Email	<input type="text"/>
Postcode	<input type="text"/>

* Required

Q2b Identify the field from the form for which a presence check is being used.
You must justify your choice. [2]

Student's response

A presence check must be used in the email field. The asteria () beside it indicates that it is required and cannot be left out.*

Examiner's comments

The candidate correctly identified, and justified, the Email field as the field for which a presence check is being used. [2] out of [2] were awarded.

Q2c Identify the field from the form for which a lookup is the most appropriate validation check. You must justify your choice. [2]

Student's response

A lookup check would be most appropriate for the postcode field as products are being ordered online and so it's important that delivery is available for the postcode entered. A list of acceptable post codes / region can be contained in the file used for the check.

Examiner's comments

The candidate correctly identified the Postcode field as the field for which a lookup would be the most appropriate and described how the validation check would be implemented. [2] out of [2] marks were awarded.

Q2d Identify the field from the form for which data verification is being used. You must justify your choice. [2]

Student's response

Data verification is being used in the confirm email field. This is an example of double entry and ensures that the email entered matches the email address in the 'email' field.

Examiner's comments

The candidate correctly identified that data verification was being used in the Confirm email field and justified their choice. [2] out of [2] were awarded.

Q2e The user enters a postcode as shown in the diagram below. [4]

Postcode

By referring to this diagram, distinguish between data and information.

Student's response

Data is unprocessed raw facts and figures without meaning or context. BT1 3BG is data as out of context it is just a string of characters. Information is data which has been given context and meaning. The information in the example is that, BT1 3BG is the postcode.

Examiner's comments

The candidate distinguished clearly between data and information and referred to the diagram as was required in both cases. [4] out of [4] were awarded.

Q2f(i) Orders from customers are processed using batch processing. [4]
Explain what is meant by batch processing.

Student's response

Batch processing involves collecting similar data files and storing them temporarily. When the required number of files has been reached or a set period of time has passed e.g. end of the month, the files undergo processing. Every file undergoes the exact same processing. This is usually done at an off-peak time such as at night. No human intervention is required.

Examiner's comments

The candidate produced a reasonably clear yet succinct description of batch processing and [4] out of [4] marks were awarded. The repeated incorrect references to files were not penalised due to the quality of the rest of the response.

Q2f(ii) The order form also includes the fields OrderID and TotalOrderValue.
By referring to these fields, compare a hash total with a control total. [5]

Student's response

Batch totals are a verification method in which different fields from a table of inputs are totalled to give an overall value. The value can later be compared with the total calculated by the computer to ensure accuracy. Hash totals are a type of batch total of which the overall value will carry no meaning, such as totalling up the Order ID column in a table, as the total will carry no distinct meaning. However control totals are batch totals which carry a meaning such as totalling the Total Order Value column in a table as this will produce the overall value of all orders.

Examiner's comments

The candidate described both types of total concisely, referring correctly to the field which would be used in each case. The difference between the two totals was explained and the use of each total was related to the order form as required.

The candidate's response was assessed as a Band 2 response and [5] out of [5] marks were awarded.

Q3a The software of a computer system includes an operating system and application software.

Describe the main features of a multi-tasking operating system. [4]

Student's response

An operating system that allows a single user to run multiple application on one computer system e.g. word document and Internet Browser. The operating system must keep track of the progress made by the user in each table, to allow the user to switch between tasks or applications without losing any data. The operating system will allocate memory and resources accordingly.

Examiner's comments

The candidate's response identified most of the relevant points about a multi-tasking operating system using appropriate DT terminology but it did not refer to the key point that only one task is running at any one time. [3] out of [4] marks were awarded.

Q3b Describe each of the following utilities. [8]

Disk defragmenter

Student's response

The disk defragmenter utility defragments the hard disk. This involves arranging files into contiguous blocks so that they aren't spread out across the hard disk. This decreases read/write speeds as the files are all in one place. Defragmentation also leaves contiguous free space on the hard disk.

Archive software

Student's response

Archive software allows files which are no longer in frequent use to be saved externally. Files can be added and removed if and when needed. Many companies must store old data for legal reasons and archive software allows this to happen.

Examiner's comments

The candidate made three relevant points about a disk defragmenter using appropriate DT terminology. However, the reason for a disk requiring defragmenting was not addressed. [3] out of [4] marks were awarded.

Similarly, the candidate made three relevant points about archive software. However, appropriate DT terminology was not used. 'Old data' is not an appropriate term. In addition, a superfluous point was included about adding and removing files. [3] out of [4] marks were awarded.

Q3c Application software includes generic software. With the aid of an example explain what is meant by generic software. [3]

Student's response

Generic or "off-the-shelf" software is software which has been designed to solve 2 user's common problems and fulfil general needs. For example, application software such as word processing software can be bought off-the-shelf e.g. Microsoft Word Suite.

Examiner's comments

The candidate described the general purpose nature of generic software and gave an appropriate example. However, the candidate used words such as 'problems' and 'needs' instead of appropriate DT terminology. [2] out of [3] marks were awarded.

Q3d A company requires accounting software.

Explain why off-the-shelf software might be better for the company than custom-built software in this case. [6]

Student's response

Off-the-shelf software is immediately available to the company when purchased, it is already on the markup. Custom-Built wouldn't be immediately available as all stages of the system life cycle would need to be complete before being used. Also, off-the-shelf software will be cheaper than Custom-Built. The cost, for off-the-shelf, is spread over the employees whereas the cost of custom Built must be paid for completely by the client. Also, off-the-shelf software is mass produced and therefore mass testing. Most Bugs and Glitches with the software will have already been fixed. Custom Built may have bugs present. Finally off-the-shelf will have a lot of support online to help with the training of the staff i.e. videos. Although Custom Built

has the developers, the help won't be available 24/7 whereas it will be with off-the-shelf.

Examiner's comments

The candidate described the main difference between off-the-shelf software and custom-built software but neither type of software was accurately described. The issue of advantage/disadvantage was addressed but unwarranted assumptions about testing and support were made. Some appropriate DT terminology was used but there were inappropriate references to non-DT terminology such as 'glitches', 'employees' and 'mass testing'.

The candidate's response was assessed as a Band 1 response and [4] out of [6] marks were awarded.

Q4a(i) Describe how the program counter is used during the fetch-execute cycle.[3]

Student's response

The program counter contains the next instruction to be executed as soon as the instruction moves into the memory address register the program counter is incremented to point to the address of the next instruction to be executed.

Examiner's comments

The candidate made one appropriate point about the program counter, that it is incremented, and [1] out of [3] marks was awarded. The candidate stated incorrectly that the program counter contains the next instruction to be executed. Furthermore, terminology such as 'as soon as the instruction moves' is inappropriate at this level.

Q4a(ii) Explain the difference between internal memory and secondary storage. [4]

Student's response

Internal memory such as RAM and Cache are built into the computer's central processing unit and therefore are relatively fast to access and can therefore speed up the processing. Secondary storage devices such as magnetic hard disks are portable devices on which data can be read from / written to. These can be expensive hardware to purchase as extra storage devices.

Examiner's comments

The candidate described internal memory accurately and gave an appropriate example. However, while an appropriate example of secondary storage was provided, the focus was on portability and an irrelevant point relating to cost was made. [3] out of [4] marks were awarded.

Q4a(iii) Describe two ways in which the processing speed of a PC can be improved. [4]

Student's response

1. *The clock speed could be increased, as the clock speed determines how fast the computer runs-each tick represents the execution of an instruction.*
2. *Cache size, if increased, will speed up the processing of a PC as cache is a high-speed access memory and the more it can hold, the more instructions can be fetched and executed faster.*

Examiner's comments

The candidate described and justified two appropriate methods of improving the processing speed of a PC. [4] out of [4] marks were awarded.

Q4b Command line and WIMP are two types of user interface.

Evaluate these interfaces from the point of view of an experienced computer user. [4]

Student's response

WIMP consists of windows, Icons, Menus and Pointers. To an experienced computer user it can be slow as commands can't input as quickly i.e. Have to go through menus etc. Command Line allows the user to insert valid commands into the interface to be carried out. This is a lot faster for the experienced computer user as commands can be input quickly. This will therefore allow the user to carry out the task in a quicker time. Also, depending on the task, command line requires a lot less RAM than WIMP to run therefore it would be even faster.

Examiner's comments

The candidate made a distinction between the two types of user interface but did not accurately describe either interface. There was no explanation of what commands were and how they were entered by the user of the interface. Similarly, the

candidate referred to an advantage of a command line interface but this was at a superficial level.

The candidate's response was assessed as a Band 1 response and [2] out of [4] marks were awarded.

Q4c Images can be stored using data compression. [4]

Describe two advantages of data compression.

Student's response

1. Data compression reduces the file size so a compressed file will take up less space on the memory than an uncompressed file.

2. A compressed file will take less time to transmit as an email attachment than an uncompressed file as it is much smaller in size.

Examiner's comments

The candidate described two advantages of data compression and related them to relevant real life situations using appropriate DT terminology. [4] out of [4]marks were awarded.

Q5(a) Explain the difference between an intranet and the Internet. [4]

Student's response

The internet is a global computer network may up of interconnected networks using communication protocols. Access to the internet isn't restricted as it is an open global network. However an intranet is a private network which is closed to restrict access. It is usually used within organisations and requires log on details to obtain access.

Examiner's comments

The candidate made a distinction between an intranet and the Internet but did not elaborate on the way in which each is typically used. [2] out of [4] marks were awarded.

Q5(b) Describe the role of the World Wide Web Consortium (W3C). [4]

Student's response

The World Wide Web Consortium is an international body which is responsible for agreeing the web standards all over the Internet around the world. These web standards are the core set of rules in which a website must be set. The W3C therefore is responsible for setting for example, the languages web pages must be set in i.e. HTML and CSS.

Examiner's comments

The candidate was familiar with the World Wide Web Consortium and made three appropriate points about its role. [3] out of [4] marks were awarded.

Q5c(i) HTML is used to create web pages.
Explain the purpose of the anchor tag. [2]

Student's response

The purpose of the anchor tag is to create a hyperlink which will allow the user to accept another web page by clicking on it.

Examiner's comments

The candidate explained the purpose of the anchor tag using the appropriate DT terminology. [2] out of [2] marks were awarded.

Q5c(ii) Produce the HTML code to display the following unordered list. [3]

- Orange
- Green
- Blue

Student's response

```
<ul>  
<li. Orange </Li>  
<li. Green </Li>  
<li. Blue </Li>  
</ul>
```

Examiner's comments

The candidate produced the correct HTML code for the unordered list. The syntax was correct and the code was clearly presented. [3] out of [3] marks were awarded.

Q5d(i) Encryption is used when data is transmitted over a network.
Explain why data is encrypted. [3]

Student's response

Encryption is the process of making data appear unintelligible during transfer so that it is meaningless to anyone who may intercept it. This is to ensure data security and that no unauthorised users who intercept the data can understand it.

Examiner's comments

The candidate was familiar with data encryption and made two valid points. However, the response focused exclusively on how encryption is performed rather than why as was required. [2] out of [3] marks were awarded.

Q5d(ii) Compare the use of public and private keys in secure data encryption.
[6]

Student's response

When sending a message the sender will encrypt the data using the recievers public key. The only way that this data can then be decrypted is by using the recievers matching private key. The public and private keys are related through a matematical algorithm so the matching pair of public and private keys must be used to encrypt and decrypt data. Anyone can access the users public key but only the reciever will have access to their own private key.

Examiner's comments

The candidate described the nature of public and private keys and the relationship between them, both accurately and concisely. The use of a public key and the corresponding private key was explained. The candidate's use of DT terminology was accurate and appropriate.

The candidate's response was assessed as a Band 3 response and [6] out of [6] marks were awarded.

