

L3 Lead Examiner Report 1901

January 2019

**L3 Qualification in Computing
Unit 2: Fundamentals of
Computer Systems**

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January 2019

Publications Code 31769H_1901_ER

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What is a grade boundary?

A grade boundary is where we set the level of achievement required to obtain a certain grade for the externally assessed unit. We set grade boundaries for each grade, at Distinction, Merit and Pass.

Setting grade boundaries

When we set grade boundaries, we look at the performance of every learner who took the external assessment. When we can see the full picture of performance, our experts are then able to decide where best to place the grade boundaries – this means that they decide what the lowest possible mark is for a particular grade.

When our experts set the grade boundaries, they make sure that learners receive grades which reflect their ability. Awarding grade boundaries is conducted to ensure learners achieve the grade they deserve to achieve, irrespective of variation in the external assessment.

Variations in external assessments

Each external assessment we set asks different questions and may assess different parts of the unit content outlined in the specification. It would be unfair to learners if we set the same grade boundaries for each assessment, because then it would not take accessibility into account.

Grade boundaries for this, and all other papers, are on the website via this link:

<http://qualifications.pearson.com/en/support/support-topics/results-certification/grade-boundaries.html>

Unit 2: Fundamentals of Computer Systems

Grade	Unclassified	Level 3		
		P	M	D
Boundary Mark	0	23	36	49

Introduction

Unit 2: Fundamentals of Computer Systems for BTEC Level 3 National in Computing became available for first teaching in September 2016. And examination opportunities will continue to be available for this unit twice a year in January and May/June. This unit is a mandatory unit for all learners studying either the Extended Certificate (360 GLH), Foundation Diploma (510 GLH) or Extended Diploma (1080 GLH).

This unit, along with Unit 1 (Principles of Computer Science), is assessed through a written examination paper. The examination is designed to test learners' understanding of computer systems within a range of contexts. The paper is divided into four main questions, each with several sub parts. Each main question is based around a unique scenario; each scenario is outlined at the beginning of that question and additional information and/or stimulus is provided with individual parts as required.

While appropriate credit is given for learners who demonstrate appropriate 'stand-alone' knowledge, more successful learners can apply their understanding to the scenarios provided in the question.

The paper is designed to assess the full grade range of the qualification; as such the paper is ramped so that it gradually increases in difficulty as the questions progress with a higher percentage of 'Pass' targeted marks in the earlier parts of the paper and the higher-grade questions towards the end.

Introduction to the Overall Performance of the Unit

While detailed analysis of specific questions in the paper appears later in this report, it should be noted that overall learner performance in this series dropped compared to the January 2018 series. This series saw a significant increase in the number of centres that are new to the qualification, which may explain some of the issues seen in the learners' performance.

Understanding of the basic subject knowledge and vocabulary was an area identified as an area of concern following the Summer 2017 examination series and despite an improvement in the 1801 and 1806 series this issue was again evident during this examination.

Learners seem to be well prepared in terms of the understanding of the requirements of different command verbs, with responses often showing good structure. However, many learners still do not demonstrate the depth of knowledge or appropriate application to the scenario to make maximum benefit of more extended responses. Regarding the larger explain/describe questions (three or four marks), learners often do not provide sufficient detail to gain maximum marks. This is something centres are encouraged to continue to explore with learners.

Overall performance on the extended writing questions (6, 8, 10 and 12 marks), was quite disappointing this series, with a significant number of responses not gaining any marks and many learners not attempting these questions. Where learners did gain marks, typically, these only demonstrated Mark band 1 characteristics. Centres are advised that these extended questions are designed to differentiate across pass, merit and distinction, therefore when preparing learners, they should be aware that to access the middle and top mark bands, responses should demonstrate good subject knowledge that is applied in context.

Centres are encouraged to look at the sample assessment materials, previous papers and sample marked learner work with learners and ensure they are familiar with the design and expectation of the paper. Ensuring that learners are aware of the requirements of particular command verbs, definitions of which can be found in the specification for this unit, would greatly improve learner performance.

While it was clear that some centres have made use of a range of support materials, such as the sample assessment materials, there was still a pocket of learners repeating answers verbatim from sample materials/past papers when presented with similar topics. While these learners could demonstrate some understanding and were

duly credited, these responses were often not applied to the given scenario and therefore often only demonstrated superficial understanding. Centres are encouraged to work with learners in exploring computing use in a range of scenarios and adapting responses to suit these scenarios.

Individual Questions

Tests or Exams

The following section considers each question on the paper, providing examples of learner responses and a brief commentary of why the responses gained the marks they did. This section should be considered with the live external assessment and the corresponding mark scheme.

Q1a

Performance on this question was generally good with most learners able to gain at least 2 out of the 4 marks available. Typically, learners were able to state two functions of the server but were often not able to describe that function.

Centres should note that a 'describe' command word is related to 'how' and therefore responses to these types of question should focus on a process or technical details.

Example response:

(a) David's computer systems use a server. This is shown as 'Device A' in **Figure 1**.

Describe **two** functions David's server could perform.

(4)

Function 1

Store a backup of the desktop computers files
in case any of them break down.

Function 2

~~Net~~ Ensuring all of Davids devices are connected
to the same network and database.

Function 1

Store a backup (1) – Expansion does not gain a mark. The response is an explanation of a reason not a description of a function. To improve the response the learner should provide a technical description e.g. store a back-up (1) by controlling central storage media (1)

Function 2

'Ensuring all of David's devices are connected (1) to the same network' (1) – just enough to award a mark for Mark point 5 'Resource management' and shared resources.

3 marks awarded

Q1b

Most learners could gain 1 out of the 2 marks available for this question. In this question, learners typically could identify the need for multi-tasking or the benefit in performance of the larger RAM. However, the quality and clarity of linked response often prevented learners from achieving both marks.

Q1c

As with Q1c, and as was typical throughout the paper, learners often struggled to produced effective linked reposes and as such typically only scored 1 of the possible 2 marks.

Centers are also encouraged to work with learners on response construction, many learners were not able to achieve the 2nd mark as their 'expansion' was a repeat of the text in the question, rather than an expansion of their point showing deeper understanding.

Example response:

(c) Explain why a large secondary storage capacity (1TB SSD) may not be needed for these desktop PCs.

(2)

As their files could be saved onto ~~the~~ David's server as the computers are connected to it.

Saved onto David's Server (1)

'As the computers are connected to it' (1) – Taken as a whole, this shows enough understanding of 'store is networked'. While this was awarded, centers are encouraged to work with learners to ensure that they have a solid grasp of technical vocabulary and can apply it effectively.

2 marks awarded

Q1d

Examination was often an issue here with many learners, although providing benefits of desktop PCs, did not provide benefits that were to the designer but instead to the company and its owner. At this level, learners are expected to be able understand a given scenario and can differentiate and apply knowledge accordingly. Typically, learners produced responses that gain 1 out of the 3 marks available.

Example responses:

David is replacing the computers used by his designers. He needs to choose between desktop PCs and laptops.

(d) Explain **one** benefit to the **designers** of continuing to use desktop PCs.

(3)

one of benefits of continuing to use desktops is that the parts are upgradable and replaceable with less waste or laptop making the company money. and also the PC's are more customisable to the specific designers needs.

'Parts

are upgradable' (1)

'...to the specific designers needs' (1)

The middle part of the response relating to saving the company money is not awardable. Responses for this question must focus on benefits for the Designers and not the company

2 marks awarded.

A benefit for the designers to continue using PCs is because they suit the job more. PCs are likely to have bigger or better quality screens, which is suitable for photo editing. As well as that, the use of PC tools such as the mouse compared to a trackpad would also make this process better.

'Likely to have bigger screens' (1)

'...which is suitable for photo editing' (1)

'as well as that...tools such as the mouse compared to a track pad would also make this process better' (1) – Although this does not appear in the mark scheme, it is impossible to include very possible answer, examiners are experts and are trained to use professional judgment to award for explanations of benefits not listed, as long as these benefits are appropriate for the scenario.

3 marks awarded

Q1e

Learners performed quite well on this question with most being able to provide linked responses that could achieve at least 2 out of the 3 marks available. Typically, learners were able to identify the ability to upgrade parts and thus reduce the need to replace whole systems. Generally, it was clarity of response rather than depth of understanding that prevented learners from achieving the third mark here. Centres are encouraged to work with learners on developing writing skills and examination techniques to ensure clear and succinct responses.

Q1f

Learner performance here was very disappointing with many learners unable to demonstrate understanding of the types of operating system as listed in the specification. Many learners were not able to recall the names of the OS listed (e.g. Single-user Single task. Multi user etc.) instead many learners provided brand names e.g. Linux, Windows etc., which in this case did not address the question. As a result, many learners did not gain any marks in this question.

Q2a

Performance on this question was quite varied. Although the average score on this item was 2 marks out of a possible 4, and some 4 mark responses were seen. Many learners did not gain any marks here. Where learners did not score any marks, this was usually due to not having attempted the question. The most common error that prevented learners gaining top marks was not using matrices in their calculation.

Q2b

Performance on this question was quite disappointing with the majority of learner unable to correctly represent the provided matrix in column-major order. For many this was clearly an area of the syllabus that they were unfamiliar with. Centres are encouraged to ensure that learners cover the full scope of the specification when preparing for the examination.

Q2c

Typically, learners were able to gain 1 out of a possible 2 marks here. Learners could represent the positive number '2' in 8-bit binary, however most learners were unable to represent negative numbers correctly and so did not gain the second mark. Another common mistake was not representing numbers as a full 8-bit binary number.

Example responses:

(2)

	Assignment 1	Assignment 2	Difference	8 bit binary
Student X	56	58	2	00000010
Student Y	67	43	-24	-00011000

Student X= "00000010" – (1)

Student Y= "-00011000"- No mark

1 mark awarded

(2)

	Assignment 1	Assignment 2	Difference	8 bit binary
Student X	56	58	2	010
Student Y	67	43	-24	11000

Student X= 010 – No mark this is not represented as an 8-bit binary number

Student Y= 11000- No mark, not 8-bit and would be + 24 not -24

No marks awarded.

Q2d

Learner responses on this question were often quite weak, and again many blank responses were seen. When learners did gain marks typically responses gained only 1 out of the 4 marks available, usually for identifying that relational databases provide links between data. Generally, there were two areas of improvement that could be made here.

1. Learners did not have the technical understanding of relational databases. Centres are encouraged to make use of the 'Technology Update' when developing teaching and learning materials. This is available from the Pearson website and provides the details of the scope of software, hardware etc. that will be used in the examinations.
2. Examination technique. Where learners did demonstrate understanding of relational databases, they were often unable to clearly articulate this in their written response, and as such often failed to achieve full marks on for their response. Centres are encouraged to spend time working with learners to improve their examination technique.

Example responses:

(4)

A benefit of using a relational ~~task~~ for this database for this task is that it is easier for Jia to be able to compare the test results that her students receive.

No mark – ‘can compare results’ does not show enough specific understanding of relational databases.

A relational database allows the user to search just ~~one~~ ^{one} thing about the student and then they can see all data in relation to the student instead of all the data being stored ~~separately~~ ^{separately} through no relation so each of the 4 things being stored would have to be searched and found individually, allowing all data to be stored in relational database through the relation of the student makes finding the data much easier and quicker.

‘see data in relation to student instead of the data being stored separately’

(1) Alternative wording for Mark Point 6 - so data can be related to / associated with other data in different ways

‘so each of the 4 things being stored would have to be searched...individually’

(1) – there is enough understanding to award Mark Point 7 - to allow more complex/customised searches

‘makes finding the data much easier’ (1) – Mark point 8

3 marks awarded

In this response, the learner shows that they understand relational databases and most likely has the potential to gain full marks. However, their response was not always clearly articulated.

Q2e

Learners responses here were generally quite good as many learners were able to gain 2 or 3 marks out of the possible 6. As with other questions on the paper, many learners were not able to present well-constructed answers so they often were unable to provide linked responses that showed deeper understanding to gain the higher marks. One other major issue here was incorrect interpretation of the scenario. Many learners did not correctly extract information and so were not able to correctly explain potential impacts on the user.

Example responses:

(6)

Access

She may not be able to access all of her data at all times as some now requires a live connection to the colleges system. However, she will have more space locally on her system for other resources.

Productivity

Since she can't always access the data it will likely decrease her productivity as if she needs data she cannot access nothing can be done. However, her system will likely run more efficiently meaning performing tasks will take less time.

Access:

'She may not be able access all of her data' (1)

'requires a live connection to the college' (1)

Productivity:

'She can't always access data' (1)

'Decrease productivity' (1)

4 marks awarded

Access

Limited to her laptop and college network meaning she can only do certain bits of work at home, depending on what she has saved.

Productivity

Productivity is increased because she can ~~work~~ work from home as well as college.

Access:

'limited to...network' (1) - mark point 4

'...depending on what she has saved' (1) - mark point 1

Productivity:

No mark awarded – although she may be able to access the college network from home, she may not be able to access locally stored data from college.

2 marks awarded

Q3a

Learner performance on this question was generally very disappointing with most learners going only 1 out of a possible 4 marks and many gaining 0 marks. As with other parts of the paper, many learners were unable to provide a suitable, linked technical description of how VoIP allows users to make calls over the internet, and often just repeated parts of the question. Many blank responses were seen, again

centres are encouraged to make use of the 'Technology Update' to aid with teaching and learning.

Example response:

Describe how VoIP allows users to make voice calls over the internet.

(4)

VoIP requires each party to have a microphone equipped with an Analogue to Digital Converter, that converts sound into data. The data is put into packets, and streamed live to the other party through software such as Skype.

'Analogue to digital converter' (1)

'The data is put in to packets' (1) just enough for mark point 4

'streamed live' (1) - enough for in real time - mark point 7

3 marks awarded

Q3b

Performance on this question was quite varied and was typified the learner performance across most of the extended questions. The average score on this question was quite low as many learners either left the question blank or were unaware of their technical aspects of packet data and packet switching. Where learners did respond correctly the general quality of responses was quite good and learners were typically able to present responses that were characteristic of mark band 2. Where many responses were let down was in the depth and technical understanding of their answers. Many could identify that the IP address is contained in the packet, and that packet switching allows packets to take different routes over a network, but often did not go further than this.

Many learners produced responses that clearly drew on preparation materials and past papers, however these were often presented in an unchanged way and as such did rarely applied to the scenario. It is evident that centres are using these

materials to prepare learners, which is to be encouraged, however centers are encouraged to now work with learners on how they apply knowledge they have acquired and apply it to new situations.

Example responses:

(b) Grant sends some files to a client using the internet.

Packet data is used when data is transmitted over the internet.

Analyse how packet data ensures data reaches its intended destination.

You should cover the content of the packet and packet switching.

(6)

When data ~~is sent~~ travels over the internet, it is split into packets, as this is more efficient. It contains 3 major parts: the header, payload and footer. The header is where the packet makes sure that it reaches the right destination as it includes the packet number, destination address and source address. The destination address is used in order to direct the packet by in the fastest way, by the routers. ~~The~~ If there is a error and the data needs re-sending, it is a message is sent to the source address, and the packet number is there in order

to make it possible to reconstruct the packet and identify missing ~~parts~~ parts. The payload is the ~~actual~~ actual data that needs to be delivered. In the footer, there will be a error correction section, such as parity scheme, which will ensure that the data has reached the correct destination in its correct form; if this isn't the case it will use the source address in ~~order~~ order in order to ask for needed data using forward error correction or automatic repeat request. In order to make it possible for the packet to be readable, there are sections which tell the computer which part ends and starts where.

Knowledge and understanding:

The learner shows accurate technical understanding of the process of packet switching and the content of a data packet

The learner uses accurate technical vocabulary throughout their response. While this is not considered in isolation, typically more successful learners use accurate technical vocabulary accurately which demonstrates deeper understanding.

Breaking the problem down:

The learner has effectively broken the situation down in to appropriate parts. The response is structured around the packet structure and how the content helps the packet get delivered.

Analysis

There is a well-developed and logical analysis, parts of the data packet are discussed and the links to how these aid the packets' deliveries are clear.

The response fully meets the descriptor for Mark band 3.

6 marks awarded

(6)
A packet of information contains a header, a body, and a tail. The body stores a part of the information that needs sending, and the head stores where the package is going, where it came from, and what it contains. Specifically it contains the IP address of the intended recipient, the IP address of the sender, and the number of which packet it is. This is important for packet switching.

Packets will take the fastest route at the time, which may mean they arrive out of order. They are switched around according to their packet number.

Knowledge and understanding:

The learner shows mostly accurate knowledge and understanding. (e.g. the header contains IP addresses and a packet number) they show a reasonably sound understanding of packet data. Packet switching is covered but not in much detail.

The learner does not always use correct technical vocabulary, which is an indicator of weaker understanding.

Breaking the problem down:

The learner has addressed both parts required by the question (the content of the packet and packet switching) however, their response could be developed further when it comes to addressing how these help the packet reach its destination

Analysis

There are some interrelationships mentioned but these are not explored in detail.

Using 'best fit' the descriptor for Mark Band 2 is the most appropriate

4 marks awarded

Q3c

Learner performance on this question was quite disappointing with most learners only producing responses in mark band 1. Many learners did not have the full, required technical understanding, with many confusing symmetric and asymmetric encryption. Where learners did correctly distinguish between the two methods, responses were often superficial and rarely applied understanding to the scenario. To achieve higher marks learners must be able to apply their understanding to the scenario, it is advised that where possible they make use of contextual examples. For example, in this question learners could refer to the fact that as many of his clients are in different parts of the world, getting the key to the clients in a secure manner may prove to be difficult.

Example response:

Discuss the benefits and drawbacks of using symmetric key encryption to protect Grant's files.

(10)

Symmetric key encryption uses a single key to both encrypt and decrypt the data. All involved must know this key to be able to send and receive data on that channel.

Asym

Asymmetric key encryption involves 2 keys per system.

A public key requestable/available to everyone.

A private key known ~~only~~ only to its owner.

The sender encrypts the data with the receiver's public key, to then decrypt that data the receiver must use their private key.

Symmetric key encryption has a major flaw in that anyone with access to the key can intercept and decrypt the data. This includes any malicious users who gain access to the key.

It's a security flaw that puts the customer's data at risk (data may include sensitive information such as bank/payment details, address, phone number).

Asymmetric avoids this issue by having multiple keys, unless the malicious user knows the customer's

private key they cannot make sense of the data even if they do intercept it.

However, the data is encrypted which makes it safer than if no encryption was used as any malicious user now has to intercept the data and gain access to the encryption key.

Knowledge and understanding

The response shows knowledge of symmetric key encryption and how it is implemented

Relevance to the context

There is reference to both advantages and disadvantages of this method of encryption and reference is made to the appropriateness in the given situation (protecting sensitive data of clients)

Discussion

The discussion considers different aspects of the situation and explores the symmetric key encryption in comparison to asymmetric key systems.

Using 'best fit' the response is placed at the top of mark band 2

7 marks awarded

Q4a

Learner performance on this question was the weakest of all the extended writing questions, with many blank responses and most learners unable to show more than a superficial understanding of the subject matter. Many learners tried to reference the two example stored program models (Harvard and Von-Neumann) but responses were rarely moved beyond a description of the two, with little or no reference made to their appropriateness to the device in the scenario, which was

the main thrust of the question. Where learners did attempt to address the device answers rarely showed a deep enough understanding to move beyond mark band 1.

Example responses:

Discuss the suitability of using the 'stored program model' for Sarwar's new entertainment system.

(10)

Stored program model is used in many modern devices and it works by having programs installed onto the device and the kernel has the drivers for these programmes and when a program is needed the kernel is called and then the kernel will begin to give instructions to the system on how to use the program.

Having a stored program model will increase speed of the system and allow all the programs as if like streaming services and games to ~~be~~ startup quicker and this will increase user experience.

Knowledge and understanding

A basic/superficial understanding of the stored program model is demonstrated. The learner attempts to provide a technical description of how the program works in relation to the kernel.

Relevance to the context

There is only limited relevance to the scenario. The learner attempts to link the points made to streaming for example but the links and understanding demonstrated are superficial.

Discussion

There is some attempt to link ideas i.e. trying to link the nature of the stored program to performance. However, this is not fully explored.

The response is placed in mark band 1

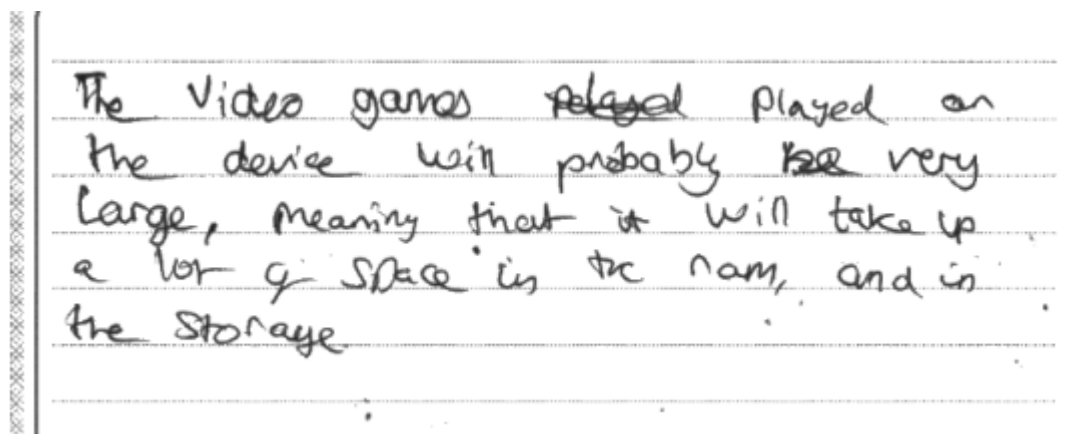
2 marks awarded

Discuss the suitability of using the 'stored program model' for Sarwar's new entertainment system. (10)

The Stored program model relies upon the code for the programs being stored in non-volatile storage, and then being copied to the RAM when ran.

This is good because it allows a single system to be able to run many programs but there can be significant loading times while the program is loaded into the RAM.

Most of the functions (streaming and internet browsing) can be done from a single program with different interfaces anyway.



The video games played on the device will probably be very large, meaning that it will take up a lot of space in the ram, and in the storage.

Knowledge and understanding

A sound understanding of the stored program model. The learner provides a correct technical description of the functionality of the stored program model.

Relevance to the context

The learner has made some attempt to relate the points that they make to the scenario (Internet browsing, streaming and games). However, these are not really explored in detail.

Discussion

There is some attempt at discussion in relation to the scenario (e.g. the use of a single program that could stream and/or browse the internet).

Some greater exploration would improve the response but the learner has made a good attempt and all points made are valid.

Using the 'best fit' approach the response is placed in mark band 2

6 marks awarded

Q4b

Performance on this question was generally slightly better than other extended questions with a higher average score and few blanks seen. However, again, learners' responses were often limited to mark band 1. While learners showed some understanding of the subject area, responses were usually superficial and rarely moved beyond simple statements such as 'Desktop CPU will be more powerful than Mobile CPU'. Learners often struggled to make suitable reference to the scenario. Many learners did attempt to provide conclusion, so are aware the demands of the 'evaluate' command word, however these were often quite superficial. To help improve responses, learners should be aware that a good

conclusion will typically reach a decision as to whether one point of view/situation is better/more appropriate than the other and use a summary of points made in their response to support that judgment.

Example responses:

(b) Sarwar has decided that the entertainment system will use a Central Processing Unit (CPU) designed for a desktop PC (microcomputer) rather than a mobile CPU.

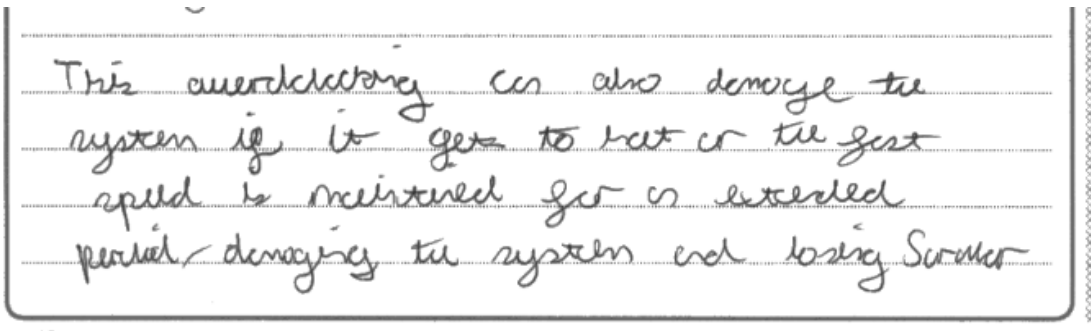
Evaluate the implications of Sarwar's decision.

Your evaluation should consider the impact on the user and the system.

(12)

Sarwar's decision to include a PC CPU rather than a mobile one will impact the user positively as they will be able to complete the tasks they want much quicker than before. Reducing the amount of time the user has to wait.

The effects on the system will be that it would be slightly overloaded as the CPU will be running faster than all the other components such as RAM and graphics card which could all cause the system to become out of sync if left for long periods.



This overclocking can also damage the system if it gets to hot or the fast speed is maintained for an extended period, damaging the system and losing Summer

Technical vocabulary

The learner makes use of some appropriate technical vocabulary to support their response.

Arguments

The learner presents several points and attempts to expand on these.

Relevant to the context

Only some of the points made are relevant to the scenario, relating to the increase in performance and its impact on the user is appropriate, however the coverage of overclocking etc is not.

Evaluation

The learner attempts to evaluate the impact of the different CPUs. However, some of the points made, such as overclocking and tasks being out of sync, are incorrect and irrelevant.

No conclusion is presented.

The response meets the descriptor for Mark band 1.

4 Marks Awarded

(b) Sarwar has decided that the entertainment system will use a Central Processing Unit (CPU) designed for a desktop PC (microcomputer) rather than a mobile CPU:

Evaluate the implications of Sarwar's decision.

Your evaluation should consider the impact on the user and the system.

(12)

Firstly, a desktop CPU will considerably increase the cost of the device, and require larger components, this will increase the overall foot print of the device.

A desktop CPU will be much more powerful than a mobile SoC CPU, and will allow for transcoding on the client side if required, and will also allow for higher quality streams, along with better multitracking.

However, a desktop CPU will produce a lot more heat than a mobile CPU, which will most likely require active cooling methods such as fans, rather than relying on convection to cool it, as mobile phones, and mobile CPUs generally do. Active cooling would both make the device rather loud, and require it to be

left somewhere with decent airflow.
The noise would be annoying while ~~watching~~ consuming media, especially in quiet scenes in movies. The storage requirements would be inconvenient, as it couldn't be left in a small area such as a cabinet ~~to~~ ^{can} be under the TV itself.

In conclusion, the use of a desktop CPU is impractical, especially as the only advantage is multitasking, which is likely to be needed on such a device.

Technical vocabulary

The learner makes use of appropriate technical vocabulary throughout to support their response.

Arguments

The learner presents many points, which are expanded and justified with reference to accurate information.

Relevant to the context

There is linking to the scenario and there is consideration of the impact on the system and the user. The points made are relevant and well chosen.

Evaluation

A number of evaluative statements are made throughout the response.

A conclusion is presented which comes to a decision as to which of the two choices they think is best. There is some attempt to support this conclusion, however the support is quite general and does not really make use of key facts from previous points to support this.

The response meets the descriptor for Mark band 3.

Due to a weak conclusion, the response is restricted to the lower part of the mark band.

10 Marks Awarded

Summary

Overall learners' performance dropped in this series both in terms of level of knowledge and examination technique.

Based on performance in this examination series, learners are offered the following advice to help continue this improvement:

- Develop understanding of key terminology used in the unit so that you can access the context of the question.
- Ensure that when providing answers/information your response is applied to the given context.
- Continue understanding the requirements of the different command verbs used in the unit so that you can structure your response appropriately and maximise the marks you achieve.
- Further support on the requirements of command verbs can be found in the specification and in training materials published on the Pearson website.
- For shorter response questions (5 marks or less), make note of the number of marks available this will help you identify the number of points you need to make. For example, a 4 mark 'Explain one...' style question would need to make at least four linked points, three of which expand/exemplify understanding of a single point.
- When producing extended writing responses (6 marks or more) ensure you consider a range of points, each of which should be expanded or supported with examples and applied to the given context.
- Do not leave questions blank. If you are struggling, moving on to other questions and working your way through the paper is a good idea. But makes sure you come back and attempt all questions.
- Centres are encouraged to consult the 'Technology Update' which has been published on the BTEC website. This document defines the scope of the technologies that may be used in examinations such as defining the range of 'common protocols', 'input devices' 'utility software' etc. It should also be used in conjunction with the specification when planning and delivering content.

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