



Examiners' Report Lead Examiner Feedback

January 2022

Pearson BTEC Nationals
In Computing (31769H)
Unit 2: Fundamentals of Computer Systems

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Grade Boundaries

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>

Awarding BTEC qualifications in 2022

Ofqual has [set out their plans](#) for awarding qualifications in 2022 and intend to return to a normal, pre-pandemic, approach to grading standards over by 2023. They have confirmed that 2022 will be a transition year, to reflect that we are in a pandemic recovery period and students' education has been disrupted.

Our guiding principle and approach to awarding BTEC qualification results in 2022 will be to ensure parity in relation to the approach being taken for GCSE and A level learners. BTEC courses have a different structure and design to academic qualifications - BTECs are modular qualifications (with assessments taking place throughout the course) compared to GCSEs and A levels which are linear (assessed and awarded at the same time at the end of the year), and therefore our approach needs to be different.

In 2022 we will return to the usual method of calculating BTEC qualification results, however adaptations including, U-TAGs and reduced internal assessment, are in place to provide a comprehensive package of support for students.

The basis of our awarding approach to BTECs this year is to ensure it is as fair as possible for all learners. We will use a range of evidence to set grade boundaries for the external units. Part of this evidence will be to closely monitor learner performance in all assessments that contribute to learners' final qualification grade, to ensure parity with A level and GCSEs.

Further information can be found [on our website](#) and via our Social Media channels.

31769H: Fundamentals of computer systems Unit title

Grade	Unclassified	Level 3			
		N	P	M	D
Boundary Mark	0	11	22	35	48

Introduction

BTEC Level 3 Nationals in Computing - Unit 2 (Fundamentals of Computer systems) became available for first teaching in September 2016. This is the eight time in total the examination has been sat by learners, and the return of the examination after a break due to the pandemic. 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), are 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 a number of 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 terms of average mark, was broadly in line with previous series. Although average mark was comparable, many learners often had significant gaps in knowledge (some sections left blank), and examination technique was overall weaker than the most recent comparable series.

Understanding of the basic subject knowledge and vocabulary was an area identified as an area of concern in previous examinations and for many learners this still continues to be a hurdle to accessing the paper and achieving higher marks. Many learners' responses still show significant gaps in knowledge from the core content of the specification.

Generally, learners demonstrated an understanding of the requirements of the different command verbs. However, many learners still do not demonstrate the depth of knowledge or application to make maximum benefit of more extended responses. In particular in response to the larger explain/describe questions (three or four marks) learners often do not provide sufficient detail or linked responses to gain maximum marks. This is something centres are encouraged to explore further with learners.

Previously significant progress had been made in the quality of the quality of responses in the extended writing questions (6, 8, 10 and 12 marks). However, while there were a number of learners who did perform well with the extended responses during this series, with responses seen that spanned the attainment range, there were significant weaknesses here. Many blank responses seen or often answers that provided only a couple of sentences, or did not demonstrate the depth and application of knowledge to move beyond the descriptors for Mark band. 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 to ensure learners 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 were still instances of learners repeating answers verbatim from sample materials/past papers when presented with similar topics. While these learners were able to 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

Question 1a

Performance on this question was satisfactory with the majority of learners able to access at least one of the three marks available with a significant percentage gaining at least two marks.

There were two main trends when learners performed less well these were:

- Clarity of response – many learners were hampered by vague and/or repetitive answers which did not clearly demonstrate their understanding.
- Common error/misconceptions – many learner responses related to anti-virus/anti-malware rather than a firewall. While these are often bundled as part of a suite of tools, learners need to be aware of the differences between the two.

Question 1b

Performance of learners on this question was generally good. Majority of learners were able to successfully identify two suitable ways to protect systems, where many learners were able to provide a suitable expansion to at least one of the points they made. However, learners tended to be hampered by the clarity of their responses.

Centres are encouraged to work on clarity of response and examination technique with learners as part of their examination preparation. This work could focus on the demands of specific command words (e.g. explain = point (1) expansion/justification (1) and also focusing on ensuring that when marking two points ensuring that they are distinctly different. Learners often repeat the same point with only slightly different wording, which prevents them from accessing additional marks.

Question 1c

For this question learners had to respond to a given stimulus image. The significant majority of learners were able to achieve 2 out of the four marks for this question. Typically the learners were able to identify the parts of the ticket that would be used to check the details. However, what was disappointing in overall learner performance, was the number of learners that were unable to identify suitable input devices. In many cases learners incorrectly identified the item (e.g. the QR code) on the ticket as the 'input device'.

In response to this, centres are encouraged to work on basic terminology and examination technique. In particular, centres are encouraged to access the 'Technology update' so that they are aware of the scope of devices that should be known. Learners are also reminded to look at using key terminology as a way to decipher the requirements of the question, which will help shape their responses accordingly.

Question 1d

The performance of this question was broadly in line with expectations, with most learners being able to provide the correct logic for an AND gate. There were instances where learners had performed poorly with this question, where learners mistakenly gave the logic for an OR gate, or did not use standard/expected conventions (e.g. 'triggered/not triggered' instead of true/false). While non-conventional notation was still credited when the logic was correct, in many instances learners who did not follow the conventions had got the logic muddled, and as such did not access all marks.

Question 1e

The majority of learners were able to provide a response that gained at least one mark. Typically learners were able to identify a reason (often 'better image quality' or similar) but they were not often able to provide a suitable expansion as to WHY. Often expansions were either repetitive of the initial point made, or did not address the question.

Centres are encouraged to work with learners on how to contextualise their knowledge in addition to the earlier points made regarding clarity of response.

Q1e Example response:

(e) Explain why Darren would use uncompressed images for these photos.

(2)

Compressing these images will as result in faces of the
people not coming out right as they would be
compressed. Customers may not want to buy them
in this form so Darren has to make sure that they are
uncompressed.

Commentary:

The learner here has shown a good understating of a key point (image quality) and used contextualisation to provide a suitable expansion.

- 1- Faces of people not coming out right (1 mark) – alternative wording for MKPT 1 of the mark scheme (Higher image quality)
- 2- Customers may not want to buy them (1 mark) - alternative wording for MKPT 4 of the mark scheme

Question 1f

Majority of learners were able to provide a valid reason as to why a wired connection would be used in the given context. However, while around half of learners were also able to provide a suitable expansion, very few learners were able to provide a three mark response.

Learners often find constructing three mark explanation responses difficult and centres should dedicate time to preparing learners for this particular challenge. Where possible, learners should attempt to link three points with each subsequent point building upon the last. (e.g. Point/fact(1) expansion/explanation (1) expansion/justification (1).

Q1f Example response:

(f) The camera is connected to the booth using a wired connection.

Explain **one** reason why a wired connection is used.

(3)

One reason a ~~the~~ wired connection is used for the camera is so that photographs taken by the camera are transferred more quickly, so the visitors don't have to wait long for their photos to print out after they finish the ride. If a ~~wired~~ wireless connection was used the transfer of data would be slower.

Commentary:

In this example the learner identifies a suitable point (transfer speed) and each subsequent point made builds on the initial response.

- 1- Transferred more quickly (1 mark)
- 2- Don't have to wait long (1 mark)
- 3- Print out after they finish the ride (1 mark)

All three marks awarded against MKPT 4 of the mark scheme.

Question 2a

The majority of learners were able to access at least one of the three marks available for this question. Typically, learners were able to identify that RAM is a temporary data store. Often however learners were not able to expand their answer beyond the initial point. As mentioned on previous items, centres should work with learners on techniques for building detailed, linked responses.

Q2a Example response:

(a) Explain the purpose of Random Access Memory (RAM).

(3)

RAM is a volatile memory. This means that applications when opened will be stored here. ROM holds the OS, RAM holding apps can make this run faster.

Commentary:

- 1- RAM is volatile memory (1 mark) – MKPT 1 (temporary data store)
- 2- Applications when opened (1 mark) – MKPT 2 (for active programs)
- 3- can make this run faster (1 mark) - Awarded against MKPT 4 of the mark scheme. The final expansion could be improved by making specific reference to execution speed, but this was considered just enough to gain the mark given the rest of the response.

Question 2b

Performance on this question was generally good with most learners achieving at least one mark out of three and half of learners achieving two marks. Typically, learners were able to identify the impact on 'Improved multitasking'. Where correct expansions were provided, these usually focused on being able to load more data at the same time. As with other questions in the examination, learners often struggled to provide a further expansion, and so this should be a priority for centres when planning examination preparation materials.

Q2b Example response:

(b) Explain **one** benefit of having a large amount (8GB) of RAM in Unit A.

(3)

More ram means more data can be stored on it so more instructions / data can be saved which will means it can do many tasks at a quicker rate.

Commentary:

- 1- more instructions/data can be saved (1 mark)- More data/instructions can be preloaded
- 2- it can do many tasks (1 mark) – Multitasking
- 3- at a quicker rate (1 mark) – sufficient to award 'without a drop in performance' from the mark scheme

Although this response was awarded three marks, there are areas that could be improved in this response in terms of clarity. For example, reference to the speed here was awarded as it showed an understanding of how it was directly related to performance during multitasking (or Fetch-execute cycle).

Also, the reference to the instructions/data can be saved – without the term instructions it would not have gained the mark, as “saved” and “loaded” are not the same.

A common issue with many responses in this section was not demonstrating sufficient understanding of the difference between memory (e.g. RAM) and Storage (e.g. HDD)

Question 2c

Overall, this question was not well answered with just over half of learners providing a suitable response to gain marks. While learners who did gain marks were typically able to identify that Cache is a form of high-speed memory, relatively few learners were able to provide a suitable expansion.

Centres are encouraged to make use of the ‘Technology update’ with their learners, as well as the unit specification to build learners’ understanding of key terminology and components.

Question 2d

This question was not well answered with only around half of learners providing a suitable response to gain marks. This question, along with some of the later questions in the paper, set a trend for learner performance.

While generally learners had some good understating of some areas of the specification and were able to explore more general aspects of computing, questions that require a greater technical understanding did not see good learner performance.

One issue that occurred frequently, in this and other questions, was the repetition of answers in an almost verbatim fashion to what appear to be similar topics as in sample materials/past papers. For example, many learners here explored the concept of types of operating systems (presumably cued by the term Operating System) rather than considering how the OS/Kernel control multitasking.

Question 2e

Performance on this question was sporadic. With some learners performing well while others did not access marks due to a not having sufficient understating of core terminology, and as such got their benefits and drawbacks confused.

As previously mentioned, learners either do not construct a suitable explanation or often repeat the same point with only slightly different wording, which prevents them from accessing additional marks.

Question 2f

A significant majority of learners were able to provide responses of sufficient quality to gain at least two marks out of four, on this question.

However, they were often not able to gain three or four marks. Typically learners were able to identify suitable ways in which performance could be improved, but often were unable to provide suitable expansions. Attempted expansions on learner responses often lacked sufficient technical understating, or sometimes clarity, to achieve the marks.

Q2f Example response:

Describe **two** ways this delay could be reduced.

(4)

1 Give each unit their own processor so that they do not have to go backwards and forwards with Unit A

2 Install an upgraded processor so that it can run more all at the same time

Commentary:

- 1- Give each unit their own processor (1 mark) MKPT 1
- 2- back and forwards with Unit A (1 mark) – Just enough to award a mark. The response shows enough of an understanding of reduced strain/multitasking needed to be carried out by unit A. But the clarity of this response could be improved.
- 3- upgraded processor (1 mark) so it can run more at the same time (1 mark) – MKPT 5 of the mark scheme

4 marks awarded

Question 3 and 4 general observations

Learners typically performed less well on questions 3 and 4 than on questions 1 and 2. While there are individual aspects of each item that varied in performance there were two main trends to learner performance in the second half of the paper.

1. **Technical understanding** – while this was alluded to in the earlier parts of this report, the nature of some of the questions in Q3 and Q4 were of a more technical nature and many learners did not have the depth of understanding in these areas to access the questions effectively.
2. **Examination technique** – Q3 and Q4 contain higher tariff, and more open questions. Many learners were not able to sufficiently utilise the scenario, or show sufficient depth of knowledge to access higher marks.

Question 3a

Many learners were able to access one of a possible four marks here, but significantly fewer learners were able to provide responses that went beyond the initial mark.

Many learners were able to identify that a data packet would contain an IP address, there was often very little technical understating shown beyond that identification.

Where learners were more successful, they clearly had a deep technical understand of how data packets work, and not just a superficial understating of basic concepts.

Q3a Example response:

(a) Raul uses specialist utility software to check the data packets on a network.

Describe how packet data helps to make sure that data is sent and received correctly.

(4)

Data packets have a header that contains information regarding the recipient's IP address to ensure that packets are received by the correct device on a network. Packet trailers contain error correcting code if packets were to be found corrupted or modified. If packets are not found to be error-free, they can be requested again or fixed using error correction code.

Commentary:

- 1- IP address (1 mark)
- 2- Recipient...ensure that packets are received by the correct device (1 mark) – as a whole this part of the response was just enough to award MKPT 5 of the mark scheme (sender and receiver clearly identified). However this response could be clearer.
- 3- error correcting code' (1 mark) -MKPT 8
- 4- not found to be error free...can be requested again' (1 mark) – MKPT 9

4 marks awarded

Question 3b

As with Q3a, learners struggled with the more technical nature of this question. Most learner provided a basic definition of a protocol and names of example protocols but did not explore how protocols govern and control data. As such relatively few learners provided responses outside of mark band 1 and a significant number of blank responses were observed.

Q3b Example response:

(b) Protocols make sure that the network handles data correctly.

Analyse how protocols govern and control data transmitted over a network.

You should use examples of specific protocols to support your answer.

(6)

The protocols in which Raul could use to keep his data secured is one of them being HTTPS with this protocol when he does have his own website this protocol will make sure that every single data is secured by his own encryption which he has the key to which is quite hard to crack. Also he could use IP in which would make sure all data he sends off is every data goes directly to where it is to be sent while making sure its contents are secure and its reaches its destination with speed as well.

Commentary:

The response shows some accurate knowledge of protocols. It has provided some example protocols (HTTPS and Transfer Protocol (TP)). The response attempts to provide an analysis of how these govern data, which it does with partial success.

The response meets the mark band level 2 descriptor of the mark scheme:

'There is SOME accurate knowledge. There are some relevant points. There is a PARTIALLY developed analysis (but not sustained).'

Question 3c

Majority of learners were able to provide a mark band level 1 response, where they had achieved between one and three marks out of the possible eight. While just less than 40% of learners were able to provide a mark band 2 answer, relatively few learners provided responses of sufficient quality to achieve mark band 3.

Responses often focused solely on open source being editable, but there was often little consideration of impact. Learners also often either focused on just the benefits or the drawbacks and did not provide balanced consideration of both.

Generally learners did not respond well to the extended questions and centres should consider these of focus to address with learners.

1. The extended questions are an opportunity to demonstrate deeper knowledge. Centres should work with learners to develop ideas and expand on points made. Using examples and reasons where appropriate
2. More successful learners make use of the context provided. To access the higher mark bands knowledge from the specifications core concepts should be considered and applied to the give scenario.

Q3c Example response:

(c) Raul uses open source security software on the networks that he installs.

Discuss the **benefits and drawbacks** of using open source security software.

You should provide justification and examples to support your discussion as appropriate.

(8)

A benefit of using open source software would be that the source code is readily available for anyone to see or edit. This can be useful since it allows the user to modify the software to their liking.

Another benefit would be that open source software is ~~normally~~ free ~~or~~ so he would not need to spend money on security software.

A ~~disadvantage~~ disadvantage of open source software could ~~be~~ be that most of them are made by independent people meaning there is a chance that the

security software may not be updated anymore which can in turn leave

~~the~~ vulnerabilities open. Furthermore the open source security software may have not been tested so ~~it~~ could have some defects or could have the possibility of being malicious.

Commentary:

The response makes a number of points relating to the benefits and drawbacks of open-source.

Most of the points made are accurate although final point relating to open-source not being tested is not correct.

Many of the points made are relevant and there is some attempt to expand on the points made.

The points are made mostly in isolation.

The response best meets the descriptors for mark band level 2

To move to band level three, the response would need to make greater reference to the scenario consider the benefits/drawbacks in relation to that scenario.

Question 4a

Although, learner performance on this question was slightly better than responses in Q3, this question did not perform very well overall.

Typically, most learner responses were not able to move from band 1 to band 2, responses often lacked clarity and scope was also a factor in preventing higher attainment. Responses often considered just one device and regularly did not address the question at hand.

As previously mentioned, centres should work on examination technique and developing learners' depth of knowledge, so that it can be applied appropriately in a range of scenarios.

Q4a Example response:

- (a) Marvin must choose suitable computer systems so he and his employees can work effectively.

Discuss the types of computer systems that Marvin could choose.

You should provide justification and examples to support your discussion as appropriate.

(10)
Marvin for his business would not need an expensive machine to carry out his work needed for his company. Systems such as Macs running MacOS would not be necessary due to their price and limits outside of rendering. They are also known for being ~~one~~ Any type of desktop system wouldn't work well due to how hard they are to travel with. Either a tablet device or a laptop would work with the traveling required needing access to the internet via the browser and basic data storing software. These options create ideal work conditions for both in office and out of office. Things that should further be looked into is battery life, storage availability and if it is modifiable to upgrade in the

future instead of being unfriendly and throwing them away. If Marvin was out more often than he was in his office, a tablet would be more beneficial as it's easy to use standing up and visiting clients. Laptops are better for use in the office, however, they are portable enough to carry if needed. Laptops tend to be more recyclable or modifiable than tablets. so

Commentary:

The response explores a number of valid points/needs of the company (data sharing and portability).

The response suggests suitable devices for achieving this (tablets/laptops) and discusses their relative benefits with some comparison to alternatives (desktops)

The response meets the descriptor for mark band level 2

For some of the points made it is not always clear how these link to the needs of the company and it is this which prevents it from reaching mark band 3

Question 4b

As with the other extended questions typically, most learner responses were not able to move from band 1 to band 2, responses often lacked clarity and specifically in this question did not address the demands of the command verb (evaluate).

When answering an evaluation question learners should not just try to consider the positive and/or negative aspects of a given technology or situation, but consider the impact/implications in particular reference to the given scenario. They should 'evaluate' the appropriateness (i.e. should state if it is a positive or negative thing) and provide a reasoned and supported justification for this opinion in relation to information given in the scenario.

Responses tended to focus on some of the features of spreadsheets, but without any consideration of their appropriateness for the scenario. Many responses wither neglected the comparison to database software, or did not have the technical understanding to provide a suitable evaluation.

Q4b Example response:

Marvin has chosen to use spreadsheet software to store and manipulate this data.

Evaluate Marvin's decision to use spreadsheet software rather than database software.

You should provide justification and examples to support your response as appropriate.

(12)

Spreadsheet software, like Excel, is easy to use and learn allowing a person to quickly benefit from simple filter/sort functions. Data entry and storage is also very easy with simply clicking a cell and entering the data. This compared with SQL which is needed for accessing database information is a better choice for storing low amounts of data.

However, Marvin and his employees collect ~~data~~ a lot of data which all needs to be stored and then later accessed. As the data stored in a spreadsheet builds up it will take longer and longer to open it ~~over~~ because a spreadsheet opens and

All of the data stored inside is accessed at one. If too much data is stored Martin may need to invest in better computing equipment. A database opens with no effect of how much data is stored because nothing is accessed until an enquiry from a user is inputted and even then, depending on what has called, only the relevant data will open.

Overall, they both have the same filter and search functions but databases offer other features like grouping databases together through a common field like a name so specific people/brands could be found and compared. However, databases will take a longer time for Martin and his employees to learn as they need to know SQL in order to use and view any data stored.

Commentary:

There is some reasonable attempt at an evaluation of the merits of both types of software and there is consideration of valid reasons (amount of data, efficiency and data manipulation tools)

Although competing viewpoints are attempted the response lacks some clarity and the points being made are not always clearly developed.

The response best fits the descriptors for mark band level 2

Summary

Overall learners performance was more sporadic than in previous series although the average mark was broadly similar. Typically learners performed as expected in questions 1 and 2 but significantly less well in questions 3 and 4.

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

- Continue to develop understanding of key terminology used in the unit so that you are able to access the context of the question.
- Ensure that when providing answers/information your response is applied to the given context.
- Improve understating of 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 understating of a single point.
- Develop the quality of responses to 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. General/generic answers often struggle to meet descriptors beyond that of mark band level 1.

Centres are encouraged to consult the 'Technology Update' which will be 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. and should be used in conjunction with the specification when planning and delivering content



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