BTEC

Examiners' Report/
Lead Examiner Feedback

2015

BTEC Level 1/Level 2 Firsts in Information and Creative Technology

Unit 2: Technology Systems
(20562_E04)

PEARSON

Edexcel and BTEC Qualifications

Edexcel and BTEC qualifications come from Pearson, the world's leading learning company. We provide a wide range of qualifications including academic, vocational, occupational and specific programmes for employers. For further information visit our qualifications websites at www.edexcel.com or www.btec.co.uk for our BTEC qualifications.
Alternatively, you can get in touch with us using the details on our contact us page at www.edexcel.com/contactus.

If you have any subject specific questions about this specification that require the help of a subject specialist, you can speak directly to the subject team at Pearson.
Their contact details can be found on this link: www.edexcel.com/teachingservices.

You can also use our online Ask the Expert service at www.edexcel.com/ask. You will need an Edexcel username and password to access this service.

Pearson: helping people progress, everywhere
Our aim is to help everyone progress in their lives through education. We believe in every kind of learning, for all kinds of people, wherever they are in the world. We've been involved in education for over 150 years, and by working across 70 countries, in 100 languages, we have built an international reputation for our commitment to high standards and raising achievement through innovation in education. Find out more about how we can help you and your students at: www.pearson.com/uk

Introduction

This report has been written by the Lead Examiner of Unit 2: Technology systems. It is designed to help you understand how learners performed on this test. The report provides an analysis of learner responses for each question. You will also find example learner responses, with commentary.

The external assessment for this unit is an onscreen, on-demand test. A number of tests are live within the 'test bank' at any one time and learners are allocated tests randomly. It should be noted that this report refers to the third test retired from the live 'test bank'. Whilst not all learners will have sat this particular test, the Lead Examiner's comments provide valuable feedback, relevant across different tests for this unit.

We hope this will help you to prepare learners for the external assessment for this unit.

Grade Boundaries

Introducing external assessment

The new suite of 'next generation' NQF BTECs now include an element of external assessment. This external assessment may be a timetabled paper-based examination, an onscreen, on-demand test or a set task conducted under controlled conditions.

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 (Distinction, Merit, Pass and Level 1 fallback).

Setting grade boundaries

When we set grade boundaries, we look at the performance of every learner who took the 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 should be for a particular grade.

When our experts set the grade boundaries, they make sure that learners receive grades which reflect their ability. We have awarded grade boundaries for the first time for our new next generation BTECs, so this means that a learner who receives a 'Distinction' grade on a particular test will have similar ability to a learner who has received a 'Distinction' grade on another onscreen test. Awarding grade boundaries is conducted to ensure learners achieve the grade they deserve to achieve, irrespective of variation in the external assessment.

Variations in externally assessments

Each test we set asks different questions and may asses 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 test, because then it wouldn't take into account that a test might be slightly easier or more difficult than any other.

The grade boundaries for the first onscreen, on-demand test to be retired from the test bank are shown below.

Grade	Unclassified	Level 1 Pass	Level 2		
			Pass	Merit	Distinction
Boundary Mark	0	13	23	33	43

General comments

This test is the third external assessment to be retired from the live 'test bank'. Onscreen assessment for this unit has been available on-demand since June 2013.

Live on demand testing became available in June 2013, since then a number of tests have been 'live' with up to 5 test live at any one time. Thi test was retired in summer 2015 and is Version E04 of Unit 2: Technology systems unit.

While detailed analysis of performance in specific questions is addressed later in the report some overall trends in performance should be noted at this point.

Learners performance on this test, demonstrates trends that are evident across all test versions. Typically more successful learners performacross the whole test consistently and have a broad range of knowledge of the subject matter. The performance of learners at the highest level was typified by the ability to apply understanding as well as explain and justify reasoning rather than just recall factual information.

Where learners' performance was not as good a some key characteristics were evident:
  i) Where questions required a more in depth response, such as an 'explain' question, responses often did not provide linked statements. In such questions learners should ensure that they identify a factual statement and then expand/justify that statement and not just provide two statements of fact
  ii) Many learners did not demonstrate the breadth of knowledge that would be expected for a level 2 qualification, including lack of technical vocabulary and understanding of common principles.
  iii) Learners do not have sufficient 'exam technique' to allow them to construct responses that adequately meet the demands of the question.

While most learners coped well with the onscreen nature of the many learners provide only minimal responses and often do not provide responses to some questions.

In this and other versions of the test performance by learners is similar and three key areas should be addressed, in particular with reference to questions that require more open responses:

i) Centres should work with learners to ensure they understand the requirements of the particular command verbs (e.g. How a describe differs from an explain)

ii) Where appropriate the stem and question should inform the 'context' of the learners response (i.e. the identified fact/explanation should apply to the given situation)

iii) Responses to final 'extended' question were often minimal and did fully address the expected requirements.

Question 1

Most learners performed well on this question and were able to demonstrate factual recall and identify that an operating system is an example of software.

Question 2

Performance on this question was generally very good with most learners being able to identify the two correct features of a graphical user interface (icons & control buttons).

Question 3

Performance on this question varied significantly. Many learners appear to have significant shortfalls in what would be considered fundamental terminology. In this case many learners are not clear as to the difference between memory and storage. Many learners did not gain credit here as the provided examples of memory (e.g. RAM / ROM) rather than an example of an internal storage device (e.g. HDD).

Question 4

4a
Most learners were able to correctly identify a reason for using 'off-the-shelf software'

4b
While not as successfully answers as part a, the majority of students were able to identify one advantage of 'off-the-shelf' software

Question 5

a) While many learners were able to correctly select 'Array' as a the data structure that could be used to store a series of integers, the number of earners gaining this mark was disappointing. As with other areas of the test, many learners do not appear to have sufficient grasp of technical vocabulary.
b) Performance on this part was better than part a) with most learners able to identify a record as the data structure that could hold both strings and numbers.

Question 6

6a
Learner performance on this question varied significantly. Many students were able to gain at least 1mark usually for identifying prolonged use of a monitor can lead to eye strain or headaches. Learners often did not express their understating well with many failing to identify that prolonged use a keyboard may cause pain in the wrists/hands. Very few learners identified problems using correct terminology (i.e. Repetitive Strain Injury (RSI))with many using terms such as carpal tunnel and arthritis

6b
This part highlighted a shortfall in learner knowledge and terminology. Many learners suggested that a 'comfy' chair would prevent back pain instead of an ergonomic or adjustable chair. Very few learners demonstrated sufficient knowledge of health and safety considerations and precautions when using/setting up a work station.

Question 7

7a
Many learners performed well on this question and were able to correctly identify a component that would need a heatsink. Where learners did not perform as well this was often through misinterpretation of the question and answers provided focused on things that would be used in conjunction with the heatsink (i.e. the fan/cooling compound). Centres are encouraged to work with learners to develop exam techniques and learners are reminded that they should carefully read the question

7b

This question was generally only answered successfully by the higher attaining learners. Many learners provided descriptions of alternative cooling methods (such as how water cooling or the operation of a fan would cool the system).

> (b) Describe **one** way the heat sink cools the internal component.
>
> Type your answer in the box.
>
> Heat sinks cover the whole component's surface area. This allows heat to dissipate through the heat sink then be dispersed from the internal component.

In the example we see a response that gains 1 mark out of a possible 2. The mark is awarded for showing an understanding that the heat is conducted and dissipated through the heatsink. The response could be improved and achieve 2 marks by identifying that the fins of the heat sink create a larger surface area to allow more efficient cooling/heat redirection.

Question 8

Most learners were able to correctly identify two reasons why technology systems in organisations are kept to date.

Question 9

9a

This was typically answered well with the majority of learners able to identify that an Antivirus would protect computers form malicious code. Where learners did not gain credit, responses typically suggested 'firewall'. This is a common misconception that regularly appears in a range of learner responses. Centres should work with learners to ensure that they have a sound grasp of the function of common software and hardware systems.

9b

Most students were able to correctly identify one precaution that can be taken to protect the data on a computer system

Question 10

This question generally not answered well with only a very small number of learners providing responses that were worthy of credit. Common errors here included responses that focused on mobile tablet devices (such as ipads) rather than graphics tablets that are used in connection with a laptop or desktop computer. Many learners also focused on the features offered by graphics software, e.g. editing tools, text and shape tools etc., rather than the features offered by the hardware device.

Learner performance in this question highlights 2 very important factors that typifies learner performance as a whole and allows us to identify areas that can be worked on to improve performance across the test.

These are:

Learner exam technique requires development. It is clear many learners misunderstood the question. Centres should work with learners on identifying key words and interpreting the meaning of questions so that they are able to identify the focus of their response. Learners basic understating of key terminology and hardware and software systems requires development. Many learners do not demonstrate the level of core knowledge that is expected to be successful in this unit.

Question 11

While many learners were not able to gain full marks many were able to gain at least one of the three marks available for identifying the correct amount of memory required for the a postcode/8 bit string.

Question 12

Learners generally gained at least two of the available three marks, usually for correctly identifying the correct input and output device. Where learners did not achieve all three marks this was often, as noted in other questions, due to shortfall in basic technical vocabulary. In particular, learners were again unclear as to the difference to between memory and storage. Centres are encouraged to work with learners to develop their core technical vocabulary.

Question 13

<div style="text-align:center">

Targeted Specification Area: Learning Aim B1.9 how features of the CPU affect performance

</div>

Only the very higher attaining learners gained marks here. It should be noted that this in many ways was to be expected as the question was designed to test learners at merit and distinction boundaries, there are some points that can be identified that can aid learners at all grade levels.

> The performance of the central processing unit (CPU) affects the overall performance of a system. CPU performance is controlled by clock speed and bus width.
>
> Describe **two** relationships between clock speed and bus width.

As we can see from the extract, the question required learners to describe how the relationship between clock speed and bus width would affect the performance of a computer. While many responses provided a description of how clock speed affects performance was generally hampered by two main factors 1) many learners did not demonstrate understanding of 'bus width' and 2) responses did not focus on the relationship between the two but instead identified each separately. Here again leaners would benefit from focused exam preparation sessions that focus on decoding the requirements of questions.

> The clock speed represents how many cycles the computer will do per second. The bus width represents how many bits can be processed in one cycle. A higher clock speed but with a low bus width will end up being roughly a similar speed to a CPU with a lower clock speed but a wider bus width. This puts emphasis on the importance on a balance being met between them for optimal output speeds. Unless they're properly balanced then the CPU will be inefficient.

In the example we see a response that gained three out of the four available marks.

The marks were allocated as follows:
"The clock speed represents how many cycles the computer will do per second. The bus width represnets how many bits can be processed in one cycle"
"A higher clock speed with low bus width will end up being roughly similar..."
"...to a lower clock speed but wider bus width"

The fourth mark could have been gained through expaining the effect of the relationship of the two sntences allocate mark point1

Question 14

Targeted Specification Area: Learning Aim A5.2 wireless methods of data transfer

Learner performance was generally very disappointing with many not gaining any marks. Again, learner performance was hampered by issues relating to exam technique with many not providing a description of the role the Wi-Fi router provides (e.g. a description of the process of how a router connects devices to the network/internet) in connecting but more often a benefit to the company of providing Wi-Fi or a definition of what Wi-Fi is. Here again leaners would benefit from focused exam preparation sessions that focus on decoding the requirements of questions and the meaning of command words.

Question 15

Targeted Specification Area: Learning Aim C1.5 the main characteristics of high level programming languages

This question was generally very poorly answered with very few learner gaining marks. It should be noted that the question was designed to test learners at merit and distinction boundaries, but even at this level very few learners were able to demonstrate understanding of the subject matter. Again, poor performance here can be attributed to a lack of core subject knowledge on the part of the learners. While at first glance the question appears to be quite technical (i.e. focus is on Object Oriented Programming) the questions does not require interpretation of use of code and in

essence only requires the use of core definitions and meanings, which should allow most learners to achieve some measure of success.

Question 16

<div style="background-color: orange; text-align: center; font-weight: bold;">
Targeted Specification Area: Learning Aim
C2.4Completion of flow charts
</div>

Typically learners were able to gain at least one of the three available marks usually for correctly identifying the message required in the first decision box (i.e. 'is password correct') where learners tended to slip up was through incorrect application of logic and/or a limited understanding of computational process. For example, many did apply correct logical for checking if the value 'c' was less than 3 with many selecting less than 4 or using the incorrect symbol for greater or less than. Learners performance on this and in other areas of the test would greatly improve through greater exploration of computational thinking and the areas of the specification focusing on programming principles.

Question 17

<div style="background-color: orange; text-align: center; font-weight: bold;">
Targeted Specification Area: Learning Aim
A4.4 the benefits of computer networking
</div>

This question required the learners to apply understanding of the benefits to a company of using a client/server network. Performance by learners on this question varied significantly, with many learners appearing to be confused by the term client/server. Again, as in other areas of the test, learners appear to have shortfalls in common, standard terminology; this shortfall is greatly affecting their success on the paper and centres should make this a priority for development.

Where learners were successful on this question answers tended to focus on the benefits of having files located on a central server where they can be easily accessed and shared by users.

Question 18

<div style="background-color: orange; text-align: center; font-weight: bold;">
Targeted Specification Area: Learning Aim
B1.4 graphics/video hardware
</div>

The extended writing questions provide learners with an opportunity to demonstrate depth and breadth of knowledge on a given area by

deconstructing a given scenario/subject and providing numerous factual points and linked chains of reasoning.

In the responses seen most learners tended to make individual points but did not provide appropriate expansion, explanation or reasoning and as such were restricted to mark band 1.

In this particular question learners were expected to consider how the different types of graphics card (dedicated vs integrated) would affect the performance of the laptop in relation to computer gaming. As in other areas of the paper learners often did not focus their responses on the required area of the question and responses often covered features and specifications that were not related to the graphics card. This, combined with responses that often comprised of just bulleted list, meant that most learners were restricted to Markband 1.

While many learners did provide some context and explanation of some of their identified point and as such moved to mark band 2 very few learners were able to provide sufficient evidence at performance at mark band 3.

While quality of written communication, in terms of spelling, punctuation and grammar does not affect the mark awarded to responses (marks are allocated based solely on quality of content), the quality of the structure of the answers could be improved in order to access higher marks. Responses are often not logically linked and reasoning, explanations and expansions are often superficial or not appropriately linked to the given scenario. For example, in this particular question very few learners used the detail that the Laptop was for somebody who intended to play computer games to structure and focus their response.

At the lower mark band levels, there are often errors in the use and application technical vocabulary and basic technical knowledge, which often hamper demonstration of understanding.

The example shows a typical response. Although the learner in this example attempts to contextualize their response, by referencing the performance of the two card in terms of gaming, their response lacks enough reference to the differences in the two cards and how these would result in the effects they describe. This points to a lack of technical understanding (such as how the RAM in the dedicated cared would benefit the system and how the separate GPU would perform certain tasks to relieve pressure on the main CPU).

The response talks about the chips in integrated cards being 'underpowered' but there is no demonstration what this means in terms of the given scenatio.

> With gaming, having the correct graphics card is vital. A high performance graphics card is what Forhad should be looking to buy. Sadly, intergrated grahics are not the way to go when it comes to gaming, as the chips are underpowered and may burn out due to high usage and overpowering the chip. Forhad should be looking to buy the laptop with the dedicated 2 GB graphics card, as it has the correct specs that he is looking for in a gaming laptop. The fact that it is a graphics card rather than a chip, allows it to take more strain from the laptop as it'd have it's own management systems to work solely on graphics alone, rather than being a standard chip. With the serious level of gaming that Forhad undertakes, I doubt it'd be worth choosing a cheaper model, as he'd have to purchase a new laptop with intergrated graphics far sooner than if he baught one with a dedicated 2GB graphics card.

The response is placed in mark band 1 and gains 3 marks.

Ofqual

Llywodraeth Cynulliad Cymru
Welsh Assembly Government

Rewarding Learning