# Examiners' Report/
# Lead Examiner Feedback

June 2014

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

## Unit 2: Technology Systems (20562_E02)

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## 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 first 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 this onscreen, on-demand test are shown below:

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

## General Comments

This is the first test to be retired from the live test bank for this unit since the live on demand testing became available in June 2013.

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.

For the more successful learners, performance across the whole test was consistent and showed a broad understanding 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 two main 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 was evident in the more successful learners, particularly in the topic areas that traditionally may have been thought of as more 'technical' such as programming and networking.

Overall most learners performed well in questions that related to everyday computer use and were able to apply understanding of general concepts and technical knowledge (such as which laptop to choose and why) to the given situation.

While most learners coped well with the onscreen nature of the test and were able to complete the test in the allotted time, with most learners attempting all questions, performance in some areas could be improved. In particular 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

ii) Where appropriate the stem and question should inform the 'context' of the learners response ie 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**

Higher performing learners generally performed better on this question showing they understood that the media used in a HDD is magnetic. Where learners did not get this correct they generally assumed the media was optical. Centres should assist learners in understanding that the term 'media' can be used with rage of storage devices and is not exclusively used for optical media.

**Question 2**

Performance on this question was generally very good with most learners being able to convert binary notation to decimal and vice versa.

**Question 3**

Most learners were able to achieve both marks on this question by identifying a suitable input and output device that would be needed to create and use a podcast.

**Question 4**

The majority of learners were able to gain 1 out of 2 possible marks on this question. Typically for identifying the correct data type for a Y/N field (ie Boolean).

Most learners did **not** understand that a telephone number would be stored as a string and not an integer. Centres should address the use of data types with learners and explore a range of ways they are used in a range of contexts. The understanding of data types and their application would aid learners in a range of areas within the specification.

**Question 5**

Most learners were able to gain 1 of the 2 marks available for this question, typically by identifying that 'off-the-shelf ' software would be available immediately.

A common error here was that 'off-the-shelf' software did not result in licence fees. Centres should carefully address the implications of various types of software use with learners across a range of scenarios.

As an additional teaching and learning point, as well as the specific specification points within learning aim C, centres should look to highlight how the issues addressed here may cross over in other areas of the specification. Higher performing learners typically apply understanding from one specification point to demonstrate deeper understanding of the implications of another.

## Question 6

Learner performance on the question was generally below expectations with many learners not gaining any credit here.

6a
Where learners were able to achieve credit they were generally able to identify the Memory/RAM in the given diagram. Most learners were not able to identify the Data Bus.

6b
Response here tended to provide a general description that would describe the function of all buses (eg 'to carry data between the components') rather than a specific description of the function of the Address Bus.

This response gained 1 mark:

| b) State the purpose of the Address Bus.(1) |
| --- |

| Sends address information to and from the CPU |
| --- |

It would be possible to improve this response further by identifying that the address buss carries address information for memory locations to and from the CPU but this was deemed enough in this case to gain credit .

## Question 7

7a
The majority of learners were able to identify the feature shown in the given animation as a Firewall and as such gained 1 mark

7b
Despite many learners correctly identifying the firewall, a significant number of these were not able to provide an adequate description of how it works. Many learners showed that they did not understand the difference between a firewall and anti-virus software.

Learners should understand that the purpose of a firewall is not to delete malicious software (that is the job of the anti-virus) but to prevent unauthorised connections/access to a computer form a remote source.

This response gained 2 marks:

| (b) Explain the process carried out by the utility feature shown in the animation. (2) |
| --- |

| It checks incoming traffic from the network to determine the IP address from which it originated, and blocks access to any on the 'blacklist' that has previously been programmed into the firewall |
| --- |

## Question 8

Most learners were able to gain 1 mark out of 2 on this question typically for identifying, in part (a), the software used to translate source code in to machine cod as a compiler.

In part (b), learners did not perform as well with very few being able to identify the example code as 'Assembly Language'

## Question 9

Learner performance in this question was very good with the vast majority of learners able to identify the correct software that would be used for both the identified tasks.

## Question 10

Most learners were able to gain 1 mark out of  possible 2 in this question by correctly identifying that the screen resolution would be a factor in limiting talk time on the identified phone.

Where learners failed to gain 2 marks this was typically due to a lack of explanation of the correctly identified feature.

Many learners tended to try to identify two features of the phone rather than provide an expanded answer. Centre should work with learners to help them understand the requirements of the different command verbs. In this case that an 'explain' requires a factual statement which is supported by a linked explanation.

This response gains 1 mark:

| Explain **one** reason why the specification of phone 2 limits talktime. (2) |
|---|

| The higher screen resolution and faster processor speed can limit the talktime of this phone |
|---|

This response gains 2 marks:

| Explain **one** reason why the specification of phone 2 limits talktime. (2) |
|---|

| The screen resolution is greater, which means that more electricity is needed to power the display. This results in the battery being used up faster when the display is on than the other two phones. |
|---|

## Question 11

11a
Most learners were able to identify at least one feature form the given laptop specification that would limit the user from editing image and video files. This was typically the identification of the graphics card as a limiting factor.

While many learners did correctly identify the CPU as the second limiting factor many responses showed that a lot of learners do not understand the difference between storage and memory. This is something that centres should address with learners, as such a misunderstanding would impact on a learners understanding across the whole specification.

11b
Very few learners were able to identify a benefit of a 64-bit operating. Many responses were generic answers such as 'faster' which demonstrated no understanding of the impact of the 64-bit OS.

This response gained 1 mark:

| (b) State **one** benefit of a 64-bit operating system.(1) |
| --- |
| More memory can be utilised -32 bit OS can only support 3 GB of memory. |

While there is a minor error in this response (ie 32bit supports up to 4GB of RAM rather than 3 as stated by the learner) the core understanding is correct; that the 64-bit OS supports larger amounts of RAM.

## Question 12

Performance on this question was generally very good with many learners gaining 2 of the 3 marks available.

12a
Typically learners were able to correctly place 'disk cache' in the diagram but only higher attaining learners were able to identify 'cache' as sitting between the processor and main memory.

12b
The majority of learners were able to identify ROM as the non-volatile memory form the given choices.

## Question 13

13a
Very few learners were able to provide a suitable explanation of how the operating system manages resources for multi programming. Where learners did gain credit responses were usually only able to gain 1 of the 2 marks available.

The following response gained 2 marks:

(a) Explain the role of the operating system in managing resources for multi-programming. (2)

The operating system must allocate more of the CPU resources to active programs than background processes, so that the computer is responsive whilst performing background tasks.

13b
Again very few learners were able to explain how memory management works , with very few learners gaining any marks here and those that did gain credit only gaining 1 of the 2 marks available.

The following gained 1 mark:

(b) Explain the role of the operating system in memory management. (2)

The operating system must allocate memory to every application, it allocates more to active programs and programs which require lots of memory, and less to background processes.

The response does not gain 2 marks as it is not completely correct . It gains 1mark for identifying that some programs are allocated more memory than others but amount of memory is not based on if a program is active or being run in the back ground but on how much is required to perform the task/hold the data being used.

## Question 14

The majority of learners were able to use the given criteria to work out correct outputs based on the given table of data. Where learners were less successful it was clear that they had little experience of problem solving in this way.

As a general teaching and learning point, questions such as this highlight key skills in 'computational thinking' which should be addressed by centres. The skills required for this question benefit the learners across a range of areas of the specification and not just within the identified specification point.

## Question 15

Performance on this question was quite disappointing with very few learners demonstrating experience and understanding of the principals of programming.

15a.
Very few learners were able to explain what the example code does. While some learners were able to identify that the program compared the variables NumX and NumY many were not able to explain the process of how/why the Temp variable was used in order to facilitate the swap and therefore sort the numbers in to order.

This response gained 2 marks:

(a) Explain the process being carried out by the selection statement in the sub-routine.(2)

Temp as an integer variable is declared.
If the first number (NumX) is smaller than the second(NumY):
replace Temp with contents of NumY (backing up Y)
replace NumY with contents of NumX (placing X second)
replace NumX with contents of Temp (putting the backup in first position)

15b
Very few learners showed experience and understanding of programming concepts and were unable to identify the benefits of using local variables within a program.

Where learners did demonstrate some understanding of local variables, responses tended to gain only 1 of the 2 marks available.

This response gained 1 mark:

(b) Explain **one** reason why it is good practice to use local variables. (2)

It is good to practice using local variables because it means that it won't affect the whole programs it is only available in a subroutine

Here the learners has identified a suitable reason but has not explained it further to gain the second mark. To gain an additional mark the learner should explain why making it only available within the subroutine does not affect the rest of the program.

## Question 16

16a
Most learners were able to identify that the process used to keep the calendar up to date across multiple devices was 'Synchronisation'

16b
Many learners did not gain credit here as responses tended to focus on Wi-Fi connection rather than the use of a mobile Wi-Fi device which would connect to the laptop using a Wi-Fi connection but provide 3g/4g internet connectivity via mobile network.

Again, as in other explain questions, responses often did not expand on answers given which restricted learner's ability to achieve the more than 1 mark.

This response gained 1 mark:

| (b) Explain **one** advantage to Ella of using a mobile Wi-Fi device. (2) |
|---|

| with a mobile wifi device Ella can tether her laptop to the internet using her mobile phone when wifi is unavailable. |
|---|

The learner gains 1 mark for showing they understand that it would be used when out of range of a standard Wi-Fi connection but the slight misconception of using the mobile phone rather than a standalone mobile Wi-Fi device prevents the response from gaining 2 marks.

## Question 17

Very few learners were able to explain an advantage of using an event-driven language. Responses instead tended to focus on the benefits of high-level languages in general rather than specifically an event-driven language.

Where learners did identify advantages of event driven languages, responses often did not sufficiently explain why the identified feature was an advantage and so were prevented from gaining two marks.

This response gained 2 marks:

| Explain **one**advantage of using programs written in an event-driven language.(2) |
|---|

| The program is responsive, running on actions taken by the user (e.g. click, leave, arrive). This can make the program seem very interactive as the program responds only to user input, which has a multitude of uses -the least of which being feedback (like the above error: "you clicked the very edge of the button") |
|---|

## Question 18

In this question learners were asked to evaluate if cabled or wireless method should be used to extend an organisations network. Most learners were able to identify at least one feature/benefit of either a cabled or wireless network should be considered in the given context. Many were able to identify relevant features of both although these were often presented in the form of lists with little use of the context or comparison of the how either method would suit the example scenario.

The extended question is marked using a level based mark scheme, which comprises of three levels. Typically responses were placed in mark bands 1 and 2 with few responses achieving the highest mark band.

Where learners were more successful, responses considered a number of factors from both possibilities and compared their appropriateness to the given scenario.

At all mark band levels the quality of written communication could be improved . However, the higher attaining learners demonstrated a much more accurate and proficient use of technical vocabulary than at the lower levels, where errors in relatively simple technical concepts reduced the quality of responses.

Learners performing Mark Band 3 typically provided responses that were well organised at were as responses tended to be less structured at other levels

This response was place in Mark Band 3 and was awarded 8 marks:

An education and training centre is considering extending its computer network.The extended network needs to support administration, marketing and management functions in addition to training. The new network facilities culd be cabled or wireless.

Discusswhether the centre should install a cabled or wireless extension to its network. (8)

There are benefits and drawbacks to both suggestions.Cable, whether copper such as CAT5 ethernet or Fibre Optic delivers a faster connection than wireless. It is also more secure -since devices have to be physically attached to the cable to access the network it is less likely that unauthorised users will be able to 'hack in' since they would actually need to enter the buildings and plug their device in. With a wireless network, particularly if theSSID is broadcast, and WPA/WEP settings are weak this could be a problem.

On the other hand a wireless extension would make it easier to add and remove devices from the network, as there is no physical restriction on where they can be located (as long as electricity is available, or batteries are charged). It would thereforebe easier to implement a BYOD (bring your own device) policy, with employees being issued with WPA/WEP codes. Wireless signals are, of course, subject to interference from other signals, electrical items and even the weather (thunderstorms), and coverage can be poor if there are not sufficient wireless access points to broadcast. Wireless signals are also not able to penetratesolid objects such as walls very well, and this could also result in poor coverage.

On balance it would probably be best for the extension to be a mixture of cabled and wireless to take advantage of the benefits of both. Admin and marketing probably need to have a faster connection, particularly if online marketing is involved, whereas trainingand management could probably benefit from the more diverse provision available through WiFi.


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