Cambridge Technicals

IT

Level 3 Cambridge Technicals Certificates in IT **05838, 05839**

Level 3 Cambridge Technicals Diplomas in IT **05840, 05841, 05842, 05877**

OCR Report to Centres January 2017

OCR (Oxford Cambridge and RSA) is a leading UK awarding body, providing a wide range of qualifications to meet the needs of candidates of all ages and abilities. OCR qualifications include AS/A Levels, Diplomas, GCSEs, Cambridge Nationals, Cambridge Technicals, Functional Skills, Key Skills, Entry Level qualifications, NVQs and vocational qualifications in areas such as IT, business, languages, teaching/training, administration and secretarial skills.

It is also responsible for developing new specifications to meet national requirements and the needs of students and teachers. OCR is a not-for-profit organisation; any surplus made is invested back into the establishment to help towards the development of qualifications and support, which keep pace with the changing needs of today's society.

This report on the examination provides information on the performance of candidates which it is hoped will be useful to teachers in their preparation of candidates for future examinations. It is intended to be constructive and informative and to promote better understanding of the specification content, of the operation of the scheme of assessment and of the application of assessment criteria.

Reports should be read in conjunction with the published question papers and mark schemes for the examination.

OCR will not enter into any discussion or correspondence in connection with this report.

CONTENTS

Cambridge Technicals

Level 3 Cambridge Technical Certificate in IT 05838

Level 3 Cambridge Technical Extended Certificate in IT 05839

Level 3 Cambridge Technical Introductory Diploma in IT 05840

Level 3 Cambridge Technical Foundation Diploma in IT 05841

Level 3 Cambridge Technical Diploma in IT 05842

Level 3 Cambridge Technical Extended Diploma in IT 05877

OCR REPORT TO CENTRES

Unit 1 Fundamentals of IT

General Comments:

This was the first sitting of this examination. Whilst some candidates had been prepared well, there was a significant knowledge gap for many candidates. This may have been due to not enough time spent teaching for this 90 GLH unit. It is essential that candidates have a sound understanding of the content of Fundamentals of IT, as this underpinning knowledge and understanding will be needed to study the optional units.

When preparing candidates for this unit, centres should use a wide variety of resources. No single resource will contain all the necessary learning to allow candidates to access the highest grades for this unit. Resources endorsed by OCR contain an introduction to some topics included in the specification. Additional materials and research will be needed to fully prepare candidates for this unit's summative assessment.

Candidates should be reminded that this is a technical qualification. As such, answers given should be technically correct and show a level of understanding greater than that of a lay-person.

Examination Technique:

For the multiple choice questions, most candidates attempted each question. A small number of candidates did not answer all questions. Good examination technique would suggest that each question is attempted. Candidates could discount clearly incorrect answers to allow them to make a more informed choice from the distractors that remain.

A small number of candidates provided more than one answer to a single question. In these cases, the answer was marked as wrong. It is suggested that centres allow candidates to practice this style of question using the sample assessment material (and now this question paper) so they are familiar with answering multiple choice questions.

Some candidates provided answers outside of the answer box. Again, these answers were not credited as the requirement was to place a (✓) in the box next to the **one** correct answer for each question.

For Section B of the paper, the handwriting of some candidates made it difficult to understand what had been written. Where an examiner is unable to read an answer, no credit can be given. Centres should ensure candidates understand the need to ensure their answers are legible. In extreme cases, centres should consider whether a candidate would benefit from the use of a word processor for the summative assessment.

The answer space on the question paper would usually be sufficient for candidates to give their answer for all but the largest of handwriting. Candidates should resist the temptation to write more than is needed. Good examination technique requires candidates to use succinct statements to answer the given question.

Candidates should be reminded that Section B features a brief context. The context should be used in answering the question to allow full marks to be achieved.

Comments on Individual Questions:

1. ***Answer: D***
   A modem converts digital signals to analogue signals and back again.
2. ***Answer: D***
   Cloud storage is the use of servers, often hosted by a third party, and accessed using the Internet (the cloud). Some candidates missed that this question asked which of the answers was NOT a feature.
3. ***Answer: C***
   One of the benefits of using fibre optic technology in networking is that fibre optic signals are not affected by electromagnetic interference as much as an electrical connection.
4. ***Answer: C***
   A wireless access point is used by a wireless device to access a wireless network which can in turn provide access to a wired network.
5. ***Answer: A***
   It was pleasing to see that candidates were able to correctly convert between binary and decimal.
6. ***Answer: A***
   Many candidates sensibly first converted the number to binary and then converted the binary number to decimal.
7. ***Answer: A***
   When using virtual storage, it can be accessed from a single location, making it easier to back up.
8. ***Answer: B***
   When connecting devices using token ring technology, a token ring must be used. Again, some candidates missed the fact that the question asked which was NOT a feature of a token ring network.
9. ***Answer: A***
   One of the features of a Sales Ordering Process (SOP) system is to approve the finance terms for an order. A specification update has been made to clarify the meaning of certain acronyms used.
10. ***Answer: C***
    When using the Internet, personal security settings and privacy settings should be modified to meet the needs of the user.
11. ***Answer: C***
    A company's Health and Safety policy would not include information on how to maintain fitness levels.
12. ***Answer: D***
    A computer virus is a self-replicating file that installs without the consent of the computer owner. A small number of candidates stated that a computer virus was an infected file. This was not the best answer to this question.
13. ***Answer: B***
    Components of a hypervisor system include a host machine and a guest machine.
14. ***Answer: C***
    Encryption scrambles the contents of a file so that it can't be read unless it is decrypted. Most candidates were able to correctly answer this question.
15. ***Answer: D***
    The Waste Electrical and Electronic Equipment Regulations (2013) applies to the safe disposal of electronic equipment.

16. Few candidates were able to score full marks for this question. Candidates frequently stated that a firewall is used to stop hackers. At this level, technical answers, such as inspecting data packets and only allowing authorised packets through are more acceptable answers. Similarly, candidates frequently stated that anti-spyware software would be used to stop hackers. Again, this is not technically correct.

17. Most candidates were able to identify at least one advantage of cloud based storage. Often, answers included the fact that data was stored remotely, which would allow staff to work from remote locations. A disadvantage of cloud based storage was often more difficult for candidates to recall.

18a. This question asked candidate to discuss with examples, key skills a programmer should have when working for the company. It was marked using a level of response marking scheme. To answer the question correctly, candidates should use the command word, 'discuss' in this case to provide a reasoned and well written response to the question given. Marks were also awarded for the quality of the extended response. To achieve full marks, candidates should discuss more than one key skill a programmer would need, giving detailed examples, related to the context. The response given should be well structured (i.e. not jump around) and not contain factually incorrect information. Many candidates were able to score in the middle mark band with a few moving to the top mark band. A small number of centres appear to have failed to study this area of the specification.

18b. This question asked for two disadvantages of using a teleconference to interview new programmers. Some candidates mistakenly believed that a teleconference included video or that the Internet was needed. This showed a lack of understanding of the specification. Poor examination technique meant that a small number of candidates gave two answers based on a single disadvantage.

18c. Candidates were asked to describe a single benefit of programmers being a member of a professional body. Whilst some candidates clearly understood the purpose of a professional body and were able to describe a benefit in context, again, lack of coverage of specification topics meant that a number of candidates were unable to answer this question.

19. This question required candidates to evaluate a change management process. Few candidates were able to correctly answer this question. The most common incorrect answer included points relating to frequently changing the manager of the team. Again, lack of coverage of the specification meant that candidates scored poorly on this question. It is essential that sufficient time is given to deliver the whole specification, using resources from a variety of sources prior to entering candidates for the summative examination.

20. This question required candidates to put the steps from the troubleshooting process in the correct order. Many candidates were able to do this. Troubleshooting methodologies are a specification item.

21a. This question required candidates to compare the use of an off the shelf and an open source operating system. To gain full marks, candidates should give a complete comparison of multiple points. An example of a complete comparison would be 'Off the shelf software has support provided by the manufacturer, whereas open source support often relies on enthusiasts, or the original developer of the code. A common misunderstanding was that open source software is free.

21b. Many candidates were able to give one other type of operating system and explain how it could be used. The most frequent response was bespoke operating system. Some candidates gave 'closed source' which was not awarded any marks.

22a. Most candidates were able to score at least two marks for this question, explaining at least one advantage of using peer to peer technology to play games on multiple devices. A significant number of candidates ignored the context of this question, and gave responses explaining why peer to peer file sharing would be used. Again, poor examination technique prevented some candidates from gaining full marks.

22b A small number of candidates answered this question well. Those that answered client server technology were then able to describe how the technology could be used.

23. Whilst many candidates were able to correctly describe the purpose of both an application and database server, few were able to explain why both would be used. Again, lack of time covering specification content, or failing to cover the content in sufficient depth prevented many candidates from scoring well on this question.

Unit 2 Global information

General Comments:

This was the first examination series in which this unit was available for assessment. It was noted that many candidates demonstrated knowledge gaps in relation to the unit content. Centres should ensure that candidates are familiar with all areas of the unit content prior to being entered for the external examination.

The correlation between content, context and command word also appeared to be limited. Candidates should be aware of the differing command words, e.g. identify, explain, discuss, and the demands of each of these. Candidates should also be familiar with the concept that questions may have a specific focus. It is this focus which should be considered by candidates when composing their responses to questions.

In this unit, a pre-release case study is issued, providing the context for Section A of the external examination. Many candidates appeared to be unfamiliar with the context of the case study, for this external examination the context was Better Cleaning. This apparent lack of familiarity limited candidate's accessibility to many of the questions in Section A of the external examination where the questions are directly linked to this case study.

The case study also includes some research prompts for candidates. These prompts should not be ignored as the knowledge gained through completing the research will enhance accessibility to the questions in Section A.

Section B of the external examination does not require candidates to link their responses to the case study. It was, however, noted that candidates demonstrated a general lack of knowledge and understanding.

There are many resources available which can be used during the teaching of this unit. The OCR endorsed textbook should not be relied on extensively to provide candidates with a full and complete knowledge base for this unit.

Comments on Individual Questions:

Section A

This section of the external examination was directly linked to the case study, Better Cleaning.

Q1   The focus of this question was on the cleaning staff who work for Better Cleaning. This question linked to part of bullet point 1 in the research prompts in the case study.

It was pleasing to note that many candidates were able to provide advantages and a disadvantage of the use of paper. However, many candidates limited their accessibility to the marks by focussing their responses on the company rather than the cleaning staff. For example, whilst paper can be stored in a filing cabinet and used as a reference in case of any issues, this would be an advantage to Better Cleaning rather than the cleaning staff.

Q2   This question focused on the client accounts which are held on a spreadsheet by Better Cleaning, therefore, all responses to each part of this question needed to be in the context of this. This question linked to part of bullet point 1 in the research prompts in the case study.

Q2 (a)   Candidates were provided with an excerpt from the client accounts spreadsheet in the case study. This question required candidates to provide a response which was taken from this excerpt, e.g. Client ID, Prices. If candidates failed to provide a correct item of confidential data, then they were unable to access the marks allocated for this part of the question.

Q2 (b)   The case study provided information on how Better Cleaning would hope that clients could access their invoices in future. Many candidates demonstrated knowledge gaps with this question, failing to recognise that access through the Cloud would be most appropriate. Marks were awarded for those candidates who provided brand names as their response. If candidates failed to provide a correct response to part (i) of this question, they were unable to access the marks allocated for part (ii).

Those candidates who did access the marks available for part (i) were able to demonstrate some understanding of suitable characteristics of the Cloud. Acceptable characteristics included accessibility and non-location dependability.

Q2 (c)   The focus of this part of the question was related to the integrity of the data currently held on the client accounts spreadsheet. Details were provided in the case study of how incorrect invoices are being produced from the spreadsheet. Candidates had to provide a method which could be used to maintain the integrity of the data. A prompt was given in the case study relating to the current situation whereby two members of the office staff could access the accounts at the same time.

Many candidates failed to provide a correct response for part (i) of this question. This demonstrated a lack of understanding of the content of the case study and failure to carry out comprehensive research relating to the research prompts. It was noticeable that many candidates were unsure as to the meaning of integrity and its relationship to data. A response such as locking the spreadsheet would have been awarded marks for this part of the question.

As with part (b) of this question, if candidates did not access marks for part (i) they were unable to be awarded any marks for part (ii).

Part (ii) of the question required candidates to provide an explanation as to how the method they had selected would maintain the integrity of the data held in the customer accounts spreadsheet. Those candidates who were able to access the marks allocated for this part of the question, by being awarded marks in part (i), once again demonstrated knowledge gaps as to how this method could be used to maintain integrity.

Q3   This question was marked using levels of response methodology. Candidates were awarded marks based on the level of detail included in their response and the application of their response to Belter Cleaning. This question linked to bullet point 2 in the research prompts in the case study.

The command word for this question was 'discuss' and candidates needed to provide a response which considered the use of text and charts/graphs to access the highest marks. Those candidates who focused on either of these areas limited their accessibility of marks to the lowest/middle mark bands.

The focus of the question was on the use of text and charts/graphs in a monthly generated report. Many candidates were able to provide some discussion on the use of charts/graphs including these can be used to show trends and patterns and can be used to identify the most/least popular cleaning service. The responses relating to the use of text, however, were limited in scope. Acceptable responses could include such

9

areas as the fact that large paragraphs of text can become confusing for the reader and different text styles can be used to emphasise text, e.g. bold/bulleted lists.

Q4   This question was also marked using a banded response mark scheme but incorporated the quality of the response in terms of correct use of technical terms and coherent reasoning. This is denoted by the use of a * next to the question number with candidates being informed of this in the rubric on the front of the examination paper.

The focus of this question was on the security methods which could be used on the shared device. As this question was not linked with Q2, it was possible for candidates to access the full range of marks even if they failed to score marks in Q2(b). This question linked to bullet point 3 in the research prompts in the case study.

Many candidates demonstrated some knowledge relating to appropriate and differing security methods and were able to access the lowest mark band. Where a description of how differing access levels could be used by Better Cleaning, for example, was provided this enabled candidates to access marks in the lower range of the middle mark band.

Candidates should, as already detailed for Q3, provide examples related to the business described in the case study.

Q5   This question focussed on the use of Green IT within Better Cleaning and the requirements of introducing this for the office staff. This question directly related to the last research prompt in the case study.

Q5 (a)   This part of the question required candidates to provide a description of the purpose of Green IT. It was pleasing to note that many candidates were able to access the majority of the marks allocated to this question.

Q5 (b)   This part of the question focussed on the office staff. As with Q1, candidates needed to provide responses which related directly to this group of staff within Better Cleaning. Many candidates provided responses related to the recycling of old equipment and reducing the temperature of the office. Whilst these are valid points, they failed to be awarded marks as both these activities would be carried out by other staff within Better Cleaning. Acceptable responses related to the need to think before printing emails to reduce the use of paper and, carrying on from that concept, if paper was used then it should, where possible, be recycled.

Section B

Candidates did not need to apply their responses to Better Cleaning in this section of the external examination.

Q6 (a)   This question focussed on one phase, 'identify the need', of the data analysis process. This question was badly answered by most candidates who sat this external examination and demonstrated a large gap in their knowledge.

Q6 (b)   This part of the question required candidates to provide the difference between data and information. This concept is a fundamental one for a Level 3 candidate but this part of the question was poorly answered by many candidates. An acceptable response could have taken the form of data has no context whilst information is in context.

A large number of candidates felt that data was numbers whilst information was words. This type of response demonstrates a large gap in the knowledge of candidates who took this external examination.

Q7   This question was also marked using a banded response mark scheme but incorporated the quality of the response in terms of correct use of technical terms and the coherent use reasoning. This is denoted by the use of a * next to the question number with candidates being informed of this in the rubric on the front of the examination paper.

The question focussed on how RIPA could be used by a government to maintain national security. Many candidates demonstrated that they either did not know anything about RIPA so provided responses relating to a different piece of legislation, e.g. DPA. Many other candidates felt that RIPA could be used to track low level criminals such as shop lifters.

This type of response from candidates reinforces the fact that many of those entered for this external examination had large knowledge gaps.

Acceptable responses to this question could have included the interception of communications where a threat to national security had been perceived or proven and being able to access data which had been encrypted or password protected. Some candidates did understand that RIPA could be used to keep surveillance on potential terrorist groups or to monitor electronic communications based on key or trigger words.

Q8   This question focussed on external sources of information which could be used by a retailer and the characteristics of information.

Q8 (a)   It was pleasing to note that many candidates were able to describe what is meant by an external source of information.

Q8 (b)   The most common response to this part of the question was 'The Internet'. This was just enough to be awarded a mark. However, centres must take note that the source of external information must be specific to the context of the question. For example, 'Supplier Website' would have been a more robust response to the question.

Q8(c)   Candidates had to identify and describe a characteristic of information. If candidates failed to identify a correct characteristic of information, then they were unable to access the marks allocated for the description.

Many candidates were unable to identify a characteristic of information, so limiting the accessibility to the further marks allocated for this question.

Acceptable characteristics could include validity, relevance and reliability.

Q9   The focus of this question was on a hotel and an on-line reservation system. As with Q8, candidates needed to apply their responses to this context.

Q9 (a)   Candidates were required to describe the type of www.technology which would be used by the on-line reservation system. A worrying number of candidates failed to provide a correct response to this question with many providing responses relating to website addresses.

Q9 (b)   Again, many candidates failed to understand that a hotel would be included in the Business category of information holders. A list of categories which candidates should have a full knowledge of is given in the unit specification.

Q9(c)   Candidates had to provide one way in which the hotel could use the contact details of the users of the on-line reservation system. It was worrying to note that many candidates felt these details could be used to provide a booking reference number – this would be provided when the guest completes the process of booking a room using the on-line reservation system. An acceptable response could be to contact a guest by email to provide vouchers for money off a future stay.

Q9 (d)   It appeared from the responses provided by the candidates that there was some confusion between images and graphics. Many candidates provided responses relating to guests could see what the hotel/rooms look like. An image would provide this rather than a graphic.

          The use of graphics on the on-line reservation system could provide, for example, visual clues to the guests, such as a red cross for wrong/incomplete information.

Q9 (e)   The focus of this question was on the impacts to the hotel of a breach of security. Many candidates were able to access all allocated marks for this question. However, some candidates focussed their responses on the impact to the guest providing such responses as identity theft. Whilst these responses are valid they are not an impact to the hotel and so did not attract marks.

Unit 3 Cyber security

General Comments:

This course, in its current format, was launched for first teaching in September 2016. Therefore, candidates who took this examination did so after approximately four months of teaching. In many cases, this appears to have led to a lack of understanding in depth, with some answers being approached almost as if they were general knowledge questions. Unfortunately, the paper identified significant knowledge gaps across the cohort. Centres are reminded that questions may be drawn from across the specification and that candidates need to be test ready before they are entered. As well as the text book, centres need to draw from other resources, in order to ensure that the specification is covered in sufficient breadth and depth.

The paper is a technical paper that requires an understanding of technical terms. For example, the term 'hacker' has a specific meaning within the specification. Candidates should ensure that they have the necessary technical understanding from across the breadth of the specification to ensure that such technical terms are not only recognised, but understood.

In many cases, candidates appeared to have made little use of the case study and associated tasks, in their preparation. However, section B, where no context was applied, really did highlight the lack of depth and breadth of understanding.

Comments on Individual Questions:

Section A

Question 1 was referred to in the introduction (above). Unfortunately, the vast majority of candidates failed to appreciate that the term 'hacker' is not a generic term for someone who attempts to 'do wrong with computers' but has a specific meaning. Therefore, the vast majority of answers for Q1a concentrated on phishing or scamming, for example, rather than the use of advanced programming skills to gain unauthorised access to data. Question 1b suffered from a similar problem.

Context is important when answering these questions. For question 1c, candidates were asked to describe one possible impact arising from the total loss of data, held by the bank, about Humphrey. Where candidates realised that this meant the total loss, rather than the ability of one person to access the data, they gave good answers. However, in a significant number of cases, candidates ignored the stem of the question and dealt with the question as though it was a form of identity theft.

Many candidates appreciated that an attack on an individual was more likely to have come from an individual than a government and were able to give good answers to Q1d. However, the wider understanding of the incident reporting procedure, which was the focus of question e (i) to e (iii), was not evident from the answers given. The focus of these questions was on the importance to the customer. In a few cases, candidates were able to deal with this focus. However, in the majority of cases, candidates gave more general answers and ignored any benefit to the customer. Of the three questions, 1e (iii) was the best answered.

Question 2 moved the focus onto the Bank's Data Protection Policy. The general question about the meaning of 'data confidentiality' was dealt with well by most candidates. However, Question 2a(ii), which required candidates to be able to link data confidentiality breaches to how a third party could benefit from that breach, was not as well answered. In a few cases, candidates were awarded two marks, but for most, candidates gave a relatively simple answer that was almost a

rewrite of the question and did not consider the implications of holding such personal information.

Question 2b was another question that dealt with the more general question of how encryption works. In most cases, candidates identified this question as one that required a technical explanation and achieved fairly high marks. However, some candidates gave a more descriptive answer that lacked technical understanding.

Question 2c could again be regarded as a question that assessed the candidates' wider knowledge of cyber security and the quality of answers given reflected the work that many centres have done on this issue over recent years. Most candidates achieved at least two marks for this question, with a sizeable number achieving full marks.

Question 3 assessed subject knowledge as well as candidates' use of English. Generally, candidates seemed ill-prepared for this type of question and gave relatively narrow answers that tended to focus on simple and, often, single issues. This tended to be the negative impact of security, but other than this general point, candidates generally failed to expand on their answers and gave relatively poorly developed responses.

Section B

For question 4, most candidates were able to give a good description of access control, with most achieving either 2 or 3 marks.

For question 5a, few candidates appeared to appreciate the nature of an Intrusion Prevention System, and were even less prepared to justify one's use within the scenario given. The question specifically asked for examples to support any points made and candidates were, again, ill-equipped to provide these. Question 5b followed the theme set by question 5a and asked about the reactive versus proactive nature of an Intrusion Prevention System. Despite a very clear lead within the question, few candidates actually addressed this issue and, instead, gave general answers at best, that only earned a few marks.

Question 6 focussed on scammers and phishers. Candidates seemed well prepared for this sort of question and were able to compare the characteristics of these two types of attackers with relative ease and fairly good levels of success.

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