INFORMATION TECHNOLOGY

| Paper 9626/11 |
| Theory |

Key messages

Candidates must not use trade names in the examination. Where trade names are used, these will be ignored, and the answer read as if the trade name was not present. Where the trade name has been given for a piece of software and the software type has not also been given in conjunction with the trade name, this removal of the trade name usually renders the given answer meaningless.

General comments

There was a small entry for this component, so it is worth remembering that the following comments are based on a very small sample of answers.

In general, candidates could have been better prepared for this examination, as many found questions which focused on more technical areas of the syllabus challenging. Performance on the algorithm question was improved, although some candidates did not use the coding structures and terms given for this qualification.

The use and understanding of key words remain incredibly important for this examination. Many candidates failed to differentiate between, for example, questions where they were asked to describe and questions where they were asked to explain. Similarly, some candidates seemed not to understand the importance of 'justify' as a command word, so gave answers both for and against a particular decision.

Finally, candidates should be reminded to focus on the context of a question. If the question is set within a particular context, candidates need to consider the opportunities and restrictions that this context provides and structure their answers accordingly.

Comments on specific questions

Question 1

This question focused on the features and roles of primary and foreign keys. In both cases, candidates were asked to describe these features.

(a) Most responses showed awareness that primary keys were unique, but some confused fields and records. Some responses focussed on the role that primary keys play in establishing relationships between tables, but these answers were not as strong.

(b) Fewer candidates understood what a foreign key was. Those that did tended to focus on it being a primary key from a different table.

Question 2

This question was intended as a straightforward comparison question. In answering such questions, candidates are advised to make complete statements which involve both aspects of the two items being compared. Therefore, for example, the answer should not be of the nature of 'item X does the following, but the other does not'. For such an example, candidates would be awarded partial credit only, as this is not sufficiently detailed.

Performance in this question was generally good, with most responses able to define both validation and verification. Whilst some responses then gave a third statement, which was generally a point of comparison drawing on the two definitions, the majority did not.

Question 3

This question explored the differences between custom written and off-the-shelf software. Candidates were asked to explain the differences rather than describe, so they were expected to give reasons for why the differences exist. Across all three areas, answers were of mixed quality.

(a)   When considering cost as a difference, most candidates understood that off-the-shelf software was targeted at a mass audience and so the product was mass produced, but explanations tended to stop there.

(b)   For the level of support, most candidates were aware that off-the-shelf software was likely to have more support than custom written software, but a large subgroup felt that custom written software allowed complete and unfettered access to the programmer, and so support was going to be excellent for these software titles. Due to the nature of the project and the scale of production of custom written software, this claim is untrue.

(c)   For the degree of testing comparison, few candidates realised that off-the-shelf software, due to the number of sales, was very likely to have far more testing than custom written software.

Question 4

This question was a technical question that focussed on how HTTPS websites provide security of data. Where marks were achieved, this tended to be for either identifying that SSL or TSL encryption was used or for a general statement that encryption is used. Very few, if any, marks were achieved for anything more technical than these two introductory comments.

Question 5

For this question, candidates were asked to compare static and dynamic queries. Unlike **Question 3**, the question stated that candidates needed to address both similarities and differences. Where questions are based on such a requirement, candidates cannot achieve full marks unless they address both aspects of the question.

Some responses showed awareness of the answer to the question and typically focussed on the distinction between dynamic and static as their main focus. Many responses, however, were unable to give any meaningful answers to the question. Typically, responses focussed on data being static or dynamic rather than on the query being static or dynamic.

Question 6

This question gave candidates the opportunity to show their understanding of actuators and sensors. Such questions typically involve the use of a context with which candidates must work when answering the question. This question was of this nature, although the first of the three questions was a generic question which assessed candidates' understanding rather than their ability to apply knowledge. The two further questions were based on a scenario, which caused some problems for candidates. It is worth noting that the question itself was based on the stated focus of a control system.

(a)   Most responses showed some understanding that an actuator provided output from a control system, with some giving suitable examples that suited the scenario. However, a significant proportion did not sufficiently show that they understood the purpose of an actuator.

(b)   Candidates could answer this question by describing the way in which the electromagnetic field sensor operates, and so focus on changes in magnetic fields, or focus on the use within a system. However, many candidates seemed to have little understanding of what an electronic field sensor is. Most gave answers that implied that the sensor was a visual sensor on a car, rather than a device used within a car park system, and so could not be awarded credit.

(c)   When compared to **part (b)**, answers about an ultrasonic sensor showed slightly better understanding. Typically, candidates were able to state that an ultrasonic sensor measures the

proximity to an object. Occasionally, candidates stated that the system involved a sound being sent out and received back, which was worthy of more credit.

Question 7

This question required candidates to create an algorithm that used the CASE ENDCASE construct. Many candidates simply did not attempt this question, or gave answers that suggested insufficient knowledge of the concepts. Where candidates used the CASE ENDCASE construct to base the rate on the inputted job code, they tended to do well. However, some still struggled with the structure of the CASE ENDCASE construct.

As a general comment on questions such as these, most candidates did not include all features identified in the question. Typically, responses omitted an element to calculate workers' pay as well as an element to print out the workers' pay. These were both highlighted in the question and, for this instance of the question, including a print statement outputting wage would have gained the candidate credit irrespective of where that statement occurred. If that statement had also been placed outside of the CASE ENDCASE statement, further credit would have been achieved.

Question 8

This question tested candidates' ability to explain what is meant by the term 'data driven'. This proved to be something of a challenge to almost all candidates, with many variations of incorrect responses seen. Typically, candidates stated that a data driven system used a lot of data or confused a data driven system with data mining.

Where candidates linked the concept of data driven and expert systems, and so gave answers about forward chaining, this tended to result in better constructed answers which linked forward chaining and the use of rules to run through data until an identified goal is reached.

Question 9

This question focussed on the use of simulations. Computer models may simulate many different scenarios, and each scenario will present its own specialist requirements. Where a simulation has a scenario, answers given must reflect the reality of the scenario, and responses that do not fit the scenario will not be awarded credit. However, this does not preclude the use of general answers that fit alongside and do not contradict those that fit the context.

(a) In this question, the focus was on the use of a model to run simulations when designing a nuclear power plant. The reference to a nuclear power plant implies a degree of peril beyond, for example, a model to run simulations when planning a new greenhouse. Secondly, the scenarios are being used as part of the design process. Therefore, candidates should discuss the benefits of using a model to test designs for the creation of a system where, if testing was not carried out, the implications of failure would be catastrophic. Alongside this, candidates could give more generic answers about models in general.

(b) This was a less context-specific question which could have been answered well with standard statements. As with the answers to **part 9(a)**, candidates tended to give relatively complex answers which were longer than they needed to be. Candidates tended to focus on the fact that scenarios can be complex, and simulations are not guaranteed to be accurate.

Question 10

This question focused on the use of sequential access to find records of students. The records are kept in alphabetical order.

(a) Candidates were asked to explain what is meant by sequential access. Very few responses scored any marks for this question.

(b) Candidates were asked to explain how the indexed sequential method would be used to find a particular student. Candidates again did not score well on this question, with marks occasionally being achieved for stating that the system would start by ignoring all records where the surname included A to I, inclusive.

Question 11

This question followed the structure of **Question 5** and required candidates to discuss both advantages and disadvantages of using online processing compared to batch processing. As the question used the plural in each case and was worth a significant number of marks, full credit could not be awarded if the candidate focussed solely on either advantages or disadvantages. Furthermore, the question required candidates to 'discuss', so candidates were expected to give a structured answer. The use of bullet points, as opposed to a structured answer, was not worthy of full credit. Candidates could answer the question by focussing solely on the advantages or disadvantages of online processing, with minimal mention of batch processing, or could give an answer that continuously compared both by direct example.

Candidates tended to do well with this question and showed awareness that online processing implied an immediate reaction, whereas batch processing implied a wait. However, they tended to struggle with the further impacts of those differences. No response stated that online processing required more staff than batch processing. However, there was good awareness that batch processing could be done at a time when the network had reduced demand, and this was sometimes accompanied with good expansions.

Question 12

The final question afforded candidates the opportunity to show their understanding of the effectiveness of supercomputers. This question had no context and so was an open opportunity for responses to include the positives and negatives of supercomputers.

Candidates did well with this question and showed a good understanding of supercomputers and why they are used, however responses few were sufficiently complete as to be worthy of full credit.

INFORMATION TECHNOLOGY

Paper 9626/12
Theory

Key messages

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General comments

In general, candidates could have been better prepared for this examination, as many found questions which focused on more technical areas of the syllabus challenging. Performance on the algorithm question was improved, although some candidates did not use the coding structures and terms given for this qualification.

The use and understanding of key words remain incredibly important for this examination. Many candidates failed to differentiate between, for example, questions where they were asked to describe and questions where they were asked to explain. Similarly, some candidates seemed not to understand the importance of 'justify' as a command word, so gave answers both for and against a particular decision.

Finally, candidates should be reminded to focus on the context of a question. If the question is set within a particular context, candidates need to consider the opportunities and restrictions that this context provides and structure their answers accordingly.

Comments on specific questions

Question 1

This question presented candidates with a source document, from which data had been added to a spreadsheet. Candidates were asked to explain, in detail, why both validation and verification were required when entering data into a database. Candidates were expected to refer to the data presented in the question in their answers.

Most candidates had a good understanding of the terms 'validation' and 'verification', and were able to give good answers that explained how they were to be used. However, some candidates confused a limit check and a range check. Where describing a range check, it is vital that responses include awareness that a range check has both an upper and a lower value. Where responses stated a range check, but then described a limit check, no credit could be awarded.

Whilst many responses showed a good understanding of the purpose of validation and verification methods, few responses attempted to explain why both were needed. Where both are combined into one question, candidates need to address the issue of why both, in conjunction, are required.

Question 2

(a)   This question asked candidates to compare mainframe and supercomputers in terms of the types of processing and the processors they both use. Very few responses showed this, and answers generally focused on issues such as fault tolerance or how each type of computer was used.

(b)   This question continued the theme by asking about how supercomputers may be used in climate research. This gave a particular focus for the question that seemed to confuse many candidates,

as many focused on weather forecasting, rather than climate research. As a result, many responses included statements that were broadly irrelevant to the question being asked,

Question 3

This question focused on different types of user interfaces. Many responses repeated aspects from the question. For example, candidates stated that a command line interface used commands or a gesture-based interface used gestures. In cases where candidates answered in these terms, without any further expansion, no credit could be awarded. This affected a significant number of candidates.

For all three questions in this section, where candidates avoided the above error, most responses scored at least partial credit for each section, although the number who scored full credit across all three questions was relatively low.

Question 4

This question focused on the use of sensors in different scenarios.

(a)   Few responses showed an appropriate understanding of the focus of this question. Most responses assumed that the touch sensor was part of a switch or security system.

(b)   This question could be answered in one of two ways. Either candidates could focus on the heat sensing aspect of infrared sensors to detect heat from a human, or on the use of a beam through which a human walks. Most candidates focussed on the former of these. A few responses, whilst they were aware that infrared detected heat, did not state that human beings emit heat and so failed to gain the second mark.

A significant number of candidates focussed on the use of the signal from the sensor activating the alarm. This did not answer the question as the question focused on how the sensor was used, not on what the signal from the sensor would trigger or how.

Question 5

This question focused on different methods of collecting data.

Several good responses to this question were seen. Many responses noted that an electoral register was already available, whilst a questionnaire would require preparation and application. As a result, many responses scored at least partial credit for this question. However, few responses could be awarded full credit. Many candidates, for example, claimed that the level of information included in an electoral register was far beyond that which Maria required. Due to the relatively small number of fields used in an electoral register, this answer is extremely unlikely. Furthermore, many responses did not appreciate that Maria needed information about families in her town and so was likely to need information about all members of a family, not just those eligible to vote.

Question 6

This question focused on the impacts of, and remedies for, the digital divide. The focus was on the digital divide between those who live in rural and urban areas.

(a)   Most responses gave descriptive answers rather than explanations. For example, candidates could state that the lack of access to the internet or to broadband meant that users could not have the benefits of online face-to-face meetings. The impact of this could, for example, have been an inability to work from home or to have face-to-face meetings with family or friends. Most responses identified impacts with no explanation other than that those living in rural areas had no access to the internet.

(b)   Where candidates suggested remedies to those issues leading to this particular cause of the digital divide, they did well. However, many candidates gave answers that were not a solution to the cause identified in the question. For example, some responses suggested that rural areas were, by definition, poor. This link cannot be made and so such answers were not accepted.

Question 7

This question explored candidates' understanding of dynamic and static parameter queries. Many responses showed understanding of the difference between 'static' and 'dynamic' as concepts, but seemed unaware of what was meant by a static or dynamic query. Where they were aware, good answers were given, however few responses were stronger than only stating that a static parameter query would be useful as the parameter does not change.

Question 8

This question asked candidates to justify the need for generic file formats. Most responses included a statement that generic file formats could be opened by multiple software types and on multiple operating systems, but few went beyond this. Responses could, for example, have drawn the extra point that such an ability was not available for non-generic file formats. Some responses did not correctly interpret the command word of 'justify', and so gave arguments for and against. To justify an action, responses need to support an argument rather than criticise.

Question 9

This question required candidates to write an algorithm which called a procedure within a while loop and then, using selection, set the value of two variables. Whilst many responses scored well on this question, the ability to use a while loop and to call a procedure did cause some issues for candidates. Candidates also struggled with outputting two values. For example, some responses stated, "Output smallest and largest", which would not work and so was not accepted. Where responses called each variable individually, and correctly added text, this was worthy of credit.

Question 10

This question focused on techniques that are used when making videos. Across all three parts, many responses suffered from a lack of accuracy. For example, for **part (a)**, trimming removes unwanted parts at the beginning and/or end of a video. Many candidates simply stated that trimming removed unwanted parts, which was too vague. For **part (c)**, some responses focussed on adding spoken sound, assuming that the video had not collected the sound in the first place. Such responses did not answer the question and so were not worthy of credit. Had spoken sound been the focus, it is likely that the question would have asked why speech might be added.

Question 11

This question allowed candidates to show their understanding of the positive and negative impacts of using encryption when transmitting data over the internet. Many strong responses were seen for this question, however it was noticeable that responses tended to focus on the benefits of encrypting data rather than on the drawbacks.

A significant subsection of responses claimed that encryption makes data impossible to read. This is not the case. Encrypted data can still be read but it cannot be understood. Similarly, some candidates claimed that encryption ensured that data could not be intercepted, which is also not correct.

INFORMATION TECHNOLOGY

Paper 9626/13
Theory

Key messages

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In general, candidates could have been better prepared for this examination, as many found questions which focused on more technical areas of the syllabus challenging. Performance on the algorithm question was improved, although some candidates did not use the coding structures and terms given for this qualification.

The use and understanding of key words remain incredibly important for this examination. Many candidates failed to differentiate between, for example, questions where they were asked to describe and questions where they were asked to explain. Similarly, some candidates seemed not to understand the importance of 'justify' as a command word, so gave answers both for and against a particular decision.

Finally, candidates should be reminded to focus on the context of a question. If the question is set within a particular context, candidates need to consider the opportunities and restrictions that this context provides and structure their answers accordingly.

Comments on specific questions

Question 1

This was a relatively straightforward question asking candidates the difference between data and information. Candidates performed very well on this question, with many strong responses seen.

Candidates were instructed to use a numerical example, so responses which did not include this could not be awarded full credit. For the numerical example to be acceptable it had to be used to show both data and information. The use of two examples, one for data and one for information, was not accepted.

Question 2

This question focussed on saving a document as a text file rather than as a word-processed file. Candidates were asked to give four advantages of saving a document as a text file. Where candidates are asked for a specific number of answers, only the first of these up to that number will be marked. Therefore, for this question, if a candidate gave more than four answers, only the first four were marked.

The question did not use a scenario, which effectively made the question about recall of knowledge. Many strong responses were seen for this question. However, in some cases candidates stated that, for example, a text file was more portable. It is possible that this answer was an attempt to suggest that text files could be used on a wider range of software types but, if so, this was not sufficiently precise. Other responses incorrectly suggested that a text file would maintain its formatting, whereas a word-processed file would not.

Lastly, some candidates stated that a text file takes up less space. The use of 'space' in this context is too vague to be worthy of credit and 'storage space' should be referred to.

Question 3

This question presented candidates with two characteristics of mainframe and supercomputers. Candidates were asked to explain what each characteristic meant. The two characteristics were fault tolerance and heat maintenance. Having explained these concepts, candidates were then asked to explain why mainframe computers are used to process the data from a census.

The two questions about characteristics were well answered by the majority of candidates. Most were aware that fault tolerance was the ability to deal with problems that arose in the computers, so that they could carry on without too much interference, whilst heat maintenance was the ability of computers to deal with the heat they generate.

These first two questions did not have a scenario, whilst the third did. As with all scenario-based questions, candidates are advised to consider the significance of this scenario. In the case of a census, candidates should be aware that a census involves a lot of data that probably needs to be processed in a relatively short amount of time. As populations tend to increase, the data collected by successive censuses will increase over time. Any response showing this thought process would be likely to achieve full credit for this question. Typically, however, responses tended to focus on that fact that there is usually a large amount of data.

Question 4

This question was based on the use of data in banks.

(a) Candidates were generally able to suggest two data entry errors and validation methods that could alleviate these. However, many responses suggested entering a wrong number as an error which could be alleviated by validation. Many responses suggested a form of lookup validation. This would not be acceptable, as the account numbers are for new customers and so would not exist.

(b) Many candidates struggled with the concept of a hash total, although some appreciated that it was based on the comparison of two calculated figures. Very few responses showed understanding why a hash total rather than a control total would be used.

Question 5

This question explored the use of calibration. Many responses showed a fairly sound understanding of both concepts, but included statements which repeated aspects from the question, such as that two point calibration was based on two points. Where responses merely repeated the question, these could not be considered worthy of credit.

Question 6

This question explored candidates' understanding of two different types of query. Candidates were asked to describe differences.

The question itself was quite straightforward and did not involve any use of context which might cause problems for candidates. Many responses showed a good level of understanding when answering this question. However, there was also a large number of candidates who demonstrated little knowledge of the difference between these two types of query.

Question 7

This question focused on features of sound editing software by asking candidates to describe features. The features were fade in and fade out, lossless compression and lossy compression.

Whilst candidates were aware that fade in is a gradual increase in volume and that fade out is the opposite, very few stated that these effects occurred at the start and end of clips respectively. However, candidates could also state that sound levels increased up to a predetermined peak, or disappeared altogether and so those responses which gave an expanded answer scored well.

The twin concepts of lossy and lossless compression also offered little real challenge to candidates. Whilst few scored full credit across both questions, good knowledge was frequently shown. Typically, responses focused on the impact on the quality of the file, but some also stated that data was permanently removed, or not permanently lost, as appropriate.

Question 8

This question gave candidates a flowchart with errors. Candidates were asked to identify the errors and the improvements that were needed. Candidates could use the flowchart, the space or a combination of both. As the question asks for improvement to the flowchart, candidates had to ensure that suggested improvements were both relevant and able to be clearly placed on the flowchart. Where candidates answered directly on the flowchart, this location was obvious. Where candidates used the space to respond, this was not always the case. Where the location was generally made clear within the answer, or the suggested improvement could only realistically be placed in one position, credit was awarded.

Performance on the question was of a high standard, with no real difference in attainment between those who wrote directly onto the flowchart and those who used the answer space.

Question 9

Candidates were asked to further show their understanding of computational thinking and complete an algorithm. The algorithm itself gave clear instructions about what was to be included, as well as the layout that may be expected. Responses for this question were generally strong, however common mistakes included:

- Using an input statement 'input X and Y'. This would not correctly input the values for the two variables.
- Not indenting within the IF statement and not closing the IF statement.
- Not using speech marks and commas within the outputs, so that variables and text could not be separated.

Question 10

When asked to 'justify', candidates should present arguments in support of an action or a decision. Typically, candidates gave arguments that both supported and criticised the decision to use custom written software. Arguments in support of the decision tended to be that the software would be produced to directly address the needs of the person commissioning the software and would not include bloatware to distract the user. Further arguments included that the software would be guaranteed to be compatible with the organisation's already existing systems. Most responses also gave arguments against the decision. These answers did not meet the demand of the question and were not worthy of credit.

Question 11

Weather forecasting is one possible focus of the use of models. As with other questions that are based on a focus, the scenario offers both possibilities and restrictions for candidates. Possibilities included the ability to reflect on the benefits of using computer models to forecast weather, when compared to using weather forecasters carrying out calculations without the aid of a model, or the fact that a computer model allows for more reliable predictions to be made.

However, the context also meant that other possible answers could not be given. While a model can allow for values or designs to be tested in a safer environment, this does not apply to the context of weather forecasting.

All answers given here as examples were seen in candidates' responses. Where candidates focussed on the use of computer models to produce weather forecasts, responses were often reasonable but rarely excellent. Many candidates attempted to give answers that did not focus on the production of weather forecasts, or were too vague and little credit could be given. Unfortunately, most candidates fell into this second category.

INFORMATION TECHNOLOGY

Paper 9626/02 **Practical**

Key messages

For this examination, the main issues to note are as follows:

- Candidates need to take greater care with data entry and with formatting spreadsheets, particularly in the alignment of cell contents.
- Candidates need to ensure that they understand and apply appropriate validation rules to cells to restrict data entry.
- Candidates need to understand the differences between the ROUND and ROUNDUP functions and identify when it is appropriate to use each one.
- Candidates need to ensure they can apply conditional formatting to a range of cells to hide items from display in a spreadsheet.
- Candidates need to be able to work within multiple worksheets in a workbook.
- Candidates need to understand the differences between the three types of Entity Relationship Diagram (ERD).
- Candidates need to understand the conventions when drawing ERDs including the use of rounded boxes, separators between the entity and attribute names and notation used for a one-to-many relationships.

General comments

Many candidates were successful on the formatting questions within the spreadsheet, but more candidates found the use of appropriate validation rules and conditional formatting using formulae more challenging. Few candidates performed well on the ERD question in this paper.

Comments on specific questions

Question 1

Although many candidates found duplication of the image provided in the question paper relatively straight forward, a significant number introduced typographical errors. A small number of candidates introduced errors in layout to their spreadsheet. Not all candidates right aligned the contents of columns A and E, nor centre aligned the contents of columns B and F but most left aligned the contents of columns C and G. The majority of candidates merged the cells as shown. Most candidates formatted the merged cells as required. A number of candidates did not save this file as specified.

Question 2

Most candidates created two new worksheets and imported the data as specified but many did not use appropriate, short and meaningful, worksheet names. A significant number of candidates did not display the data in the 'Frost factor' column as percentage values. A number of candidates also added an extra row into their imported spreadsheets that was not required.

Question 3

Some candidates correctly applied validation rules to cells B3 and B4, fewer added appropriate text to these cells, which should have given a message to help the user enter the data and an error message if they had not entered valid data. Despite an instruction to not include drop-down menus some candidates still produced solutions including these. Most candidates allowed a blank cell, but some candidates seemed to misunderstand this instruction and allowed the text 'blank cell' as one of their valid entries.

Question 4

Some candidates correctly applied validation rules to cells B6 and B7, fewer added appropriate text to these cells, which should have given a message to help the user enter the data and an error message if they had not entered valid data. Some candidates did not set this rule to select from a drop-down list using the data placed in the worksheets in step 2, despite instructions to use this data. Some candidates did not reference the specified arrays for their lists, instead manually entering the list contents to the validation rule.

Question 5

This step was found challenging by some candidates, a number attempted to use nested IF functions rather than a form of look up. Some candidates seemed to not study the data to be looked up and recognise that the data was unsorted making solutions using LOOKUP, or VLOOKUP with a TRUE parameter (for an approximate lookup), incorrect. Many candidates correctly used VLOOKUP with a FALSE parameter or XLOOKUP to attain the correct results. Some candidates inappropriately attempted to use INDEX and MATCH functions for this question.

Question 6

This step was found challenging by some candidates, a number attempted to use nested IF functions rather than a form of look up. Some candidates seemed to not study the data to be looked up and recognise that the data was unsorted making solutions using LOOKUP, or VLOOKUP with a TRUE parameter (for an approximate lookup) incorrect. Many candidates correctly used VLOOKUP with a FALSE parameter or XLOOKUP to attain the correct results. Some candidates inappropriately attempted to use INDEX and MATCH functions for this question.

Question 7

Extending the formula in step 6 did not appear to be too challenging for candidates who had completed step 6 as specified. The addition of an additional lookup was often correct, but the most common difficulty was in the correct use of brackets to ensure that the 1 was added to the frost factor percentage before this was multiplied by the formula used to calculate the value from step 6.

Question 8

Many candidates performed this step with full accuracy.

Question 9

Many candidates performed the multiplication in this step with full accuracy, but fewer candidates attempted to round the result. Of those candidates who attempted the rounding some correctly used ROUNDUP with the **,1** parameter to determine the one decimal place. A significant number of candidates erroneously used the ROUND function which did not meet the requirements of the question.

Question 10

A number of candidates replicated the formulae placed in cells B14 and B15 rather than using the expected =B14 and =B15 formula. At AS level candidates are expected to use the most efficient method to solve each task.

Question 11

Most candidates who attempted this question performed this step with full accuracy. The most common errors were in the incorrect use of brackets, despite being given their position in the question paper.

Question 12

Many candidates performed the multiplication in this step with full accuracy, but fewer candidates attempted to round the result. Of those candidates who attempted the rounding some correctly used ROUNDUP with the **,1** parameter to determine the one decimal place. A significant number of candidates erroneously used the ROUND function which did not meet the requirements of the question.

Question 13

Many candidates performed the calculation in this step with full accuracy, but fewer candidates attempted to round the result. Of those candidates who attempted the rounding some correctly used ROUND with the **,0** parameter to determine the nearest dollar. Some candidates omitted the instruction that the contents of this cell should also be displayed to 0 decimal places, having performed the calculation and rounding correctly but displaying the rounded value, for example, as $883.00 rather than $883.

Question 14

Many candidates found this challenging and some did not attempt a solution. A number of candidates found simple solutions that checked the looked up value and if it was an X, displayed an appropriate error message rather than the X. Other candidates successfully use IFERROR functions. These solutions worked well for all cells except F16 where a reference to one of the other cells was required in order to display the required text. Fewer candidates completed this as specified for all cells including F16.

Question 15

This step was found challenging by many candidates, a number attempted to add to their formulae and labels which worked well but was not successful for the cells that contained numeric values like B11, F11 and F12. Candidates who used conditional formatting with a formula to check the contents of cells B3 or B4 frequently attained full marks. A number of candidates who found this challenging attempted to manually hide the cell contents rather than placing formulae (as instructed in the question paper). A number of candidates were successful for some cells in the range but not the specified ranges from the question. Some candidates did not use the appropriate filename when saving this version of the spreadsheet.

Question 16

This question elicited mixed responses from the candidates, some attempted no modelling and others were successful in their data entry. A significant number of candidates omitted to select either a freestanding wall or a building in cells B3 and B4, with many selecting the incorrect option, neither or both. More marks were awarded for the data entry than for the resulting values, error messages and hidden cells.

Question 17

Few candidates identified the problem that if Y was selected in B3 and B4 then no data would be visible. Of those candidates who did identify this, few offered an appropriate method of solution in their response.

Question 18

This proved a challenging question for many candidates, although most candidates who attempted it attained at least partial marks. There appeared to be a lack of understanding of the differences between the three types of Entity Relationship Diagram (ERD) by many candidates, with lots of examples of key fields and data types included which should not be part of a conceptual ERD. A significant number of candidates did not draw the entities as rounded boxes, nor did they include a separator line between the entity name and the attribute names. Some candidates did not differentiate between the two, or in some cases did not include any entity names. Many candidates had relationship lines, but some included multiple lines or lines from one attribute to another, which is not required for an ERD. Few candidates used the appropriate notation to determine the one-to-many relationship between the Customer entity and the Invoice entity. Those candidates who had the correct entity names for these two entities attained some marks for appropriate attribute names in the correct entity.

INFORMATION TECHNOLOGY

Paper 9626/31
Advanced Theory 31

There were too few candidates for this component to enable a meaningful report to be written.

INFORMATION TECHNOLOGY

Paper 9626/32
Advanced Theory 32

Key messages

In Paper 3, it is expected that candidates have a depth of knowledge of all subject topics and questions can be set on any area of the A Level topic syllabus. As such it is important that centres ensure that their candidates study the content of all the topic areas.

Candidates are also expected to customise their responses according to the command words in the questions. Questions are designed to give candidates the opportunity to demonstrate their wider understanding of the syllabus topics by providing answers that focus on the various aspects of the topics. The different command words are used to enable candidates to show that they can not only recall, select and communicate their knowledge but can also apply it, analyse and evaluate IT issues using that knowledge, as set out in the Assessment Objectives.

Centres are, therefore, reminded to advise their candidates to target their responses to the command word used in the question and to ensure that they answer the question as set. For example, where a question asks 'how' a process occurs e.g., **Q5(a)** where an explanation of how a secure Wi-Fi connection is made, there is usually little or no credit given for describing what the Wi-Fi is since this does not answer the question 'how'. Further, the command word 'explain' requires reason for e.g., the stages in the process so statements listing the steps do not fully answer the question.

General comments

While fewer candidates were omitting whole questions, centres are again advised to continue to encourage candidates to attempt all questions. Even if the candidate is less confident with that topic, despite the previous comments about targeting command words, writing a few sentences may gain valuable marks.

Candidates should read the whole of each question carefully and apply their knowledge to the scenario in the question as it is set. The full range of marks is only available for answers referring to the scenario in the questions.

Candidates should be encouraged to write full sentences and discouraged from writing bulleted, short statements in their responses. Descriptions or explanations should be conveyed in full sentences. Analyses, discussions and evaluations should also be in full sentences to properly answer the question.

Centres are advised to remind their candidates that they should not write answers based solely on words that they have 'spotted' or on 'key words' in the question. Usually this means that the response does not answer the question and will score few, if any, marks.

Comments on specific questions

Question 1

This question was about stored value cards which are cards that hold a fixed amount of money and are usually discarded when all the money has gone. The most common mistake in both parts of this question was to confuse these cards with credit cards or with digital wallets. Descriptions of stored value cards did not answer either part of the question. Comparisons with other types of card were not required but were given credit where the benefit or drawback was clear.

(a) The question asked only for the benefits and was not specific to the use by holders, merchants or to the issuing company. There was, therefore, a range of answers that could have gained credit. Good answers could have referred to the fact that no user authentication is required to use the card so it can be used anonymously, or that the seller/merchant receives money immediately because the value is transferred direct from card to the merchant's account with no intermediate bank being involved.

(b) The question asked only for the drawbacks and was not specific to those experienced by holders, merchants or to the issuing company. Only two drawbacks were required to fully answer the question. Candidates who described three or more drawbacks did not gain extra credit so centres are advised to encourage their candidates to read and follow the rubric and ensure they are not wasting valuable examination. Good answers could have referred to the total loss of the monetary value if the card is lost or stolen and to the restriction on use outside of the using authority e.g., cards issued for travel purposes cannot be used to buy food items.

Question 2

This question was about the key frames which mark the start and end points of elements, movements or actions within a computer animation. Property key frames hold the specific parameters of objects within a frame.

(a) Good answers referred to start and end points of object/element movements and to the timings of these movements within an animation. A common mistake was to omit a reason or expansion to the response – the question asked for explanations - e.g., key frames specify the timing of the movement using the position of the key frame in a sequence of frames.

(b) In this question, descriptions of how property key frames are used were required so answers that did not describe a use did not fully answer the question. Good answers could have included the fact that property key frames define the parameters of an object in a frame which can be used to directly and precisely edit or amend the properties of the object. A common mistake was to repeat the answer to part **(a)**.

Question 3

Candidates were expected to know and identify the two main types of compression used when storing bitmap images in computer files. Generic answers about compression did not gain credit. Also, the question asked for effects upon the images so references to a reduction in file size without an accompanying consequence on the image itself did not answer the question. Candidates were required to analyse both types of compression, lossless and lossy, since this was explicitly stated in the question. Common errors were to confuse the two types of compression and their effects or to compare the compression. A good answer should have included references to e.g., the ability to reconstruct the original image in its entirety when using lossless compression because no image data is lost but with lossy compression, as image data is permanently lost, the original image cannot be completely restored. Comparisons were not required but where candidates did provide a comparison, answers were credited. A good comparison of the effects of the two types involves referring to the degrading effects or compression artefacts seen in images using lossy compression but not in lossless compression.

Question 4

Cellular networks are in topic 14.11 so candidates were expected to be able to describe their structure and how they are used.

(a) Good answers described base stations for connecting to end users, a switched network for voice calls and a packet switched network for internet traffic. Few candidates included the requirement for a connection to public telecommunications systems. The question asked only for the structure so answers that described the use of cellular networks did not gain credit.

(b) In this question, candidates were expected to be able to explain the methods used to avoid interference between cellular (mobile) phone connections. The question did not ask for how cell (mobile) phones are used nor for descriptions of 3G, 4G and/or 5G connections. While great technical detail is not required, candidates should be aware of the use of e.g., spread spectrum technology, adjacent cells not using the same frequencies and the re-use of frequencies by cells some distance from each other as these are part of the structure of a cellular network.

Question 5

This question asked about connecting smartphones to a LAN.

(a)   This question was about network security. Good answers described the lack of encryption by default if no password/key is required by a WAP, the use of wireless makes it less difficult to eavesdrop on or intercept communications and the possibility of 'spoof' wireless access points. Common mistakes were to refer to e.g., 'easier to hack' or to the obstruction of wireless signals by walls. These responses did not answer the question so did not gain credit.

(b)   This question draws not only on subject knowledge but on many candidates experience of using a smartphone. However, many responses were either too vague e.g., 'use an appropriate protocol', inaccurate e.g., 'use Wi-Fi', or did not properly answer the question by covering both the establishment and the maintenance of the connection. To gain credit, answers should have explained the steps taken when establishing a secure connection, the requirements for its maintenance and why these are necessary. For example, selecting a secure wireless connection from the list of networks shown on the smartphone to avoid an insecure connection, the need to enter a password/passcode for authentication and encryption purposes and the need to use the latest protocols to ensure secure encryption is used. The full range of the many possible valid answers is given in the mark scheme.

Question 6

A common mistake in both parts of this question was to repeat the statement given in the stem of the question. Simply repeating the question gains no credit.

(a)   While many candidates could not answer this question, good answers described the number of loops depending on the outcome of testing a condition, and the syntax of the 'for …' loop in JavaScript and how this works.

(b)   This question proved difficult to answer for most candidates. Common mistakes were to confuse the operation of the two types of loop. Candidates are encouraged to fully understand iterative methods and these types of loops.

Question 7

JavaScript is a main topic in the current syllabus and candidates are expected to have a good working knowledge and understanding of how it is used when programming for the web.

(a)   Good answers described the assignment by assigning it a value. A common mistake was to use HTML constructs.

(b)   The use of a 'for in' JavaScript loop enclosed in HTML and the subsequent passing to HTML as a display method e.g., document.getElementById("xx").innerHTML = xx; would have been awarded most of the marks. Descriptions of the iteration through the properties of the object would also have scored marks. Poorer answers mistook the type of loop that could be used, ignored the use of variables or were too vague or inaccurate e.g., 'list the properties in an array'.

Question 8

The methods of implementing a new system are listed in Topic 16.5 so candidates are expected to be able to describe each of them and to be able to discuss their advantages and disadvantages. In this question, pilot implementation is the method used to install a new user interface for access to patient records at a health care organisation which has multiple sites. The scenario was chosen to allow candidates to demonstrate their understanding of how pilot implementation allows one site, or small group of users, to change the interface while the remainder use the 'old' one and to explore the pros and cons of doing this. It was not necessary to compare pilot with other possible methods of implementation because the question asked candidates to 'evaluate pilot implementation' and made no mention of the other methods. Common errors were to write answers that were too vague, inaccurate e.g., referring to manual writing of records, or did not refer to the method of implementation required by the question.

The command word 'evaluate' means to *'judge or calculate the quality, importance, amount, or value of something'* so good answers should have made a factual statement and then expanded upon this by explain

why this was good or not so good for implementing a user interface. Lists of statements about pilot implantation did not, on their own, gain credit. Reasons for choosing pilot implementation include e.g., being able to address problems in one site before the changeover in other centres which can reduce overall problems or risks to data, or user feedback can be used to assist in the training of other users at different centres which can have less impact on the patient care at the other sites. Reasons for not using pilot implementation include e.g., the excessive time period over which the complete changeover in all sites takes place with the result that the full benefits of the new system are not immediately available to all users at all centres. The full range of the many possible valid answers is given in the mark scheme.

Question 9

Answers that repeated the question or were too vague e.g., 'instant messages arrive instantly' were not awarded marks. References to instant messaging being available on most devices, at more or less any time of the day, and being of low cost are examples of how instant messaging can be of benefits to businesses. A common mistake was to describe what instant messaging is and not to refer to its benefits. Good answers related the benefits to businesses and not to individuals given the scenario in the question.

Question 10

This question was about mail servers which are used to send, store and send, or forward (email) messages. While the command word 'discuss' means *'write about issue(s) or topic(s) in depth in a structured way'*, the question as set required candidates to discuss the use of a company's own mail server in comparison with the use of a third-party mail server so both advantages and disadvantages were required in order to access the full range of marks. Poorer answers described what a mail server is or does without reference to the implications for a small company. Where a scenario is given, it is important that candidates target their answers accordingly. Many responses were either vague or inaccurate. There were many references to illegal emails, security and privacy issues that might affect employees but the question was about the advantages and disadvantages to the company. Good answers referred e.g., to customising email addresses and the ability to ensure that these were used only for company business, or to the requirement for technical expertise for maintaining mail servers which may cost too much for small company. A good answer makes a valid statement and then comments on it, giving its good or bad points.

Question 11

While many candidates could correctly identify and then describe two types of software maintenance, a number could not. Poorer answers incorrectly named the maintenance as e.g., 'updating maintenance' or 'replacement' maintenance. The names of the types of maintenance are given in Topic 16.8 so candidates are reminded to use these. To gain marks on this question, candidates were expected to correctly identify two types of maintenance and to give descriptions that matches them. For example, adaptive maintenance is used to update software when new hardware has been installed, after delivery to the users. To gain access to the full range of marks, two types were required as stated in the question. In this type of question, centres are advised to ensure that candidates give the requisite number of types and that they do not give more than the required number.

INFORMATION TECHNOLOGY

Paper 9626/33
Advanced Theory 33

Key messages

In Paper 3, it is expected that candidates have a depth of knowledge of all subject topics and questions can be set on any area of the A Level topic syllabus. As such it is important that centres ensure that their candidates study the content of all the topic areas.

Candidates are also expected to customise their responses according to the command words in the questions. Questions are designed to give candidates the opportunity to demonstrate their wider understanding of the syllabus topics by providing answers that focus on the various aspects of the topics. The different command words are used to enable candidates to show that they can not only recall, select and communicate their knowledge but can also apply it, analyse and evaluate IT issues using that knowledge, as set out in the Assessment Objectives.

Centres are, therefore, reminded to advise their candidates to target their responses to the command word used in the question and to ensure that they answer the question as set. For example, where a question asks about 'how' a process has an affect e.g. **Question 4** where an explanation of how the use of technology enhanced learning affects candidate motivation, there is usually little or no credit given for describing what technology enhanced learning is since this does not answer the question 'how'. Further, the command word 'explain' requires reasons so statements that merely list facts do not fully answer the question.

General comments

While fewer candidates were omitting whole questions, centres are again advised to continue to encourage candidates to attempt all questions. Even if the candidate is less confident with that topic, despite the previous comments about targeting command words, writing a few sentences may gain valuable marks.

Candidates should read the whole of each question carefully and apply their knowledge to the scenario in the question as it is set. The full range of marks is only available for answers referring to the scenario in the questions.

Centres are advised to remind their candidates that they should not write answers based solely on words that they have 'spotted' or on 'key words' in the question. Usually this means that the response does not answer the question and will score few, if any, marks.

Candidates should also be encouraged to write full sentences and discouraged from writing bulleted, short statements in their responses. Descriptions or explanations should be conveyed in full sentences. Analyses, discussions and evaluations should also be in full sentences to properly answer the question.

Comments on specific questions

Question 1

This question was about the use of social media in health care. Answers that wrote only about social media and what it is or how it is used by individuals without reference to health care did not gain credit. It is important that candidates address their answers to the given scenario because generic answers do not properly answer the question. At A Level, candidates are expected to use their knowledge to show that they understand IT topics in context. Answers that gained credit included descriptions of, e.g. the use of social media by governments or organisations (and possibly individuals) in spreading awareness of diseases or health issues, the use by governments when alerting and educating the public to medical emergencies, and

for the discussion and exchange of ideas/knowledge about health issues. All descriptions of valid uses were given credit but there were some answers that were vague, e.g. 'help keep people healthy', or inaccurate, e.g. confusing social media with the searching of websites.

Question 2

This question was about mail merge. At A Level, candidates are expected to understand how mail merge works as well as to be able to use it.

(a) The question asked about manual checking for errors and why it is necessary. The expected answers were those that pointed out that software tools cannot check for, e.g. stylistic or contextual errors, or for inaccurate or missing content. While many candidates provided responses that were detailed, a significant number of answers were vague, e.g. 'to check that the invitations were correct' without an explanation of what was meant by that statement. In the context of checking data, i.e. validation and verification, manual, or otherwise, it is important to be very precise in the meaning as any ambiguity in responses will result in credit not being given.

(b) This question was found to be challenging by candidates. Manual completion methods are used in mail merge to allow users to insert data, e.g. a name or date at the time of the merge. Usually a prompt is made and the user types in the relevant data allowing the merge to proceed. A typical method would be, e.g. the use of a fill-in field in the location of required date with a prompt to ensure the user completes the field manually. Good answers explained the use of such a methods in some detail.

Question 3

Manipulating the shapes in vector images is in Topic 18.2 and it is expected that candidates be able to understand and use, e.g. node (anchor or control points) and path editing techniques. The question was specifically about the shapes within a vector image but a significant number of candidates gave responses that focussed on the whole image. While some credit was given for these answers, they were not properly answer the question. Answers should have referred to, e.g. Bezier handles, moving, adding or deleting nodes with a description of how these could be used to change the shapes.

Question 4

Some good answers to this question were seen where candidates explained how using technology enhanced learning (TEL) could affect the motivation of candidates. The better answers referred both to increased and to decreased motivation with explanations such as TEL can lead to increased effort by enhancing the meaning of materials or it can decrease motivation because there might not be a teacher physically present to answer questions promptly.

Question 5

Some good answers to this question were seen in which candidates gave the facts about peer-to-peer networking and then expanded with explanations or descriptions of why these were advantageous or not. However, many answers were vague, e.g. 'it's secure because it's between certain companies'. Communication technology is a major topic in this syllabus so it expected that candidates know and understand the different types of networks. Good answers discussed the lack of a centralised system ensuring that the failure of one device does not affect the others but it also means that, e.g. files are not centrally organised or backed-up.

Question 6

This question was about documentation and was a challenge for candidates.

(a) The purpose of technical documentation is to provide information for software engineers or technicians who are continuing development, or maintaining the software after it has been deployed. Few candidates could distinguish it from other software documentation. A good answer would have noted the target audience of the documentation and how and when it would be used.

(b) This question was a real challenge and most candidates could not describe the contents of technical documentation. For this question, one which is asking candidates only to recall

knowledge, there are many more than six items of information that could have been included in a response to gain the full marks. It is important that candidates study all the topics in the syllabus.

(c)   The most obvious answer to this question is user documentation and many candidates described this. However, there are other documents e.g. specifications that are created during the development of a software application and most candidates seemed to be unable to describe these. At A Level, it is expected that candidates draw on knowledge gained by the study of different areas of the syllabus when writing their responses.

Question 7

This question was about the terms used when referring to JavaScript statements. Candidates are expected to be aware of the correct terminology and well as being able to use JavaScript.

(a) (i)   This question was a challenge for the majority. Few candidates could correctly describe what is meant by 'operand'.

(ii)   Most answers to this question were inaccurate. Operator precedence is a concept that applies not only when writing JavaScript statements but in other areas of study.

(iii)   Assignment operators, used to give a value to a variable, are a major part of programming in JavaScript and most candidates were able to describe them correctly.

(iv)   This question was a challenge and few candidates could correctly describe what is meant by 'literals' in JavaScript.

(b)   This question was found to be challenging and most candidates could not describe another group of reserved words. Good answers could have included, e.g. reserved words from other languages used in programming for the web and HTML property names.

Question 8

(a)   Most candidates could describe identity theft as pretending to be another person by using their personal information but few went on to expand on this to gain the second mark. Details such as, e.g. the use is unauthorised, there is personal gain by the thief, or theft causes harm to the victim would have scored the second mark.

(b)   Most candidates gave good answers to this question. To gain the marks the descriptions had to be in some detail, e.g. victims find it difficult to correct false information held by credit institutions given by the thieves who stole their identity, so can be financially liable for the debts of the thieves.

Question 9

The command word 'evaluate' means to *'judge or calculate the quality, importance, amount, or value of something'* so candidates were expected to make factual statements about project management software (PMS) and then expand on these with comments about whether these facts helped or hindered the project. Some good answers to this question were seen in which candidates gave and judged the importance of the points they made. A good answer could have included, e.g. PMS can allow team members to collaborate using communication tools in real-time so that each team member is kept up to date with problems as they arise or, e.g. PMS cannot carry out specialised tasks, such as financial planning, as well as specialised software, for example spreadsheets, so team members may need to use specialised applications for some tasks, adding to the expense and complexity of the project management. In this type of question it is important that candidates give both points of view, making comments on points that support, as well as comments on drawbacks.

Question 10

Some good answers to this question were seen in which candidates discussed the benefits and drawbacks to business of data mining. To answer questions that require candidates to 'discuss' a topic, candidates should make a statement and then expand upon it with further comments which, in the case of such questions as this one, point out the benefit or drawback of the point as it relates to the scenario. In this question, points had to relate to businesses and not to individuals so responses that referred to customers' privacy or security did not properly answer the question. A good answer would have included references to,

e.g. businesses can discover trends or links between data that are not immediately obvious because data mining analyses a vast amount of data from numerous sources, or businesses may lose control of their customer data when it is used for data mining and could be responsible for any data loss which may be expensive to address. Where the question specifically states that benefits and drawbacks are required, candidates must give both to access the full range of marks.

INFORMATION TECHNOLOGY

Paper 9626/04
Advanced Practical

Key messages

As in previous series, the problem-solving elements of the tasks proved to be the most challenging aspect for candidates.
Whilst the skills required for the advanced practical paper are not beyond those required for the AS level, there is an extra dimension in that candidates need to determine how to use those skills to solve the problems posed at A-level.

General comments

Whilst the need for precision and attention to detail in all the tasks still needs stressing, there were a number of other common issues that caused candidates to not be awarded marks. Many candidates were unable to demonstrate the appropriate level of skill necessary to submit complete solutions to all the tasks and successful solutions to the tasks that involved more than carrying out prescribed steps were rarely seen.

Comments on specific questions

Task 1 – Bitmap Graphics

The task depended upon skill with the selection of areas and the use of layers. The critical part of the selection was the area between the castle walls. The castle had to be selected with all other areas, land and sky, removed and then saved with a transparent background. All bitmap graphics applications have the necessary tools to achieve this by selection of objects or a selection of a colour range. Even without a selection of objects tool, selecting a colour or a suitable colour range could cut-out the castle precisely since the walls were consistently shades of grey.

Almost no candidates cut-out the castle with sufficient precision. Details in the roof on both sides were often erased or the background was left visible. A few candidates tried to manually rub-out the central area with eraser tools. Of those that attempted the task in this way, very few used a background eraser tool and so the area in question was not transparent. It would also have been very difficult to achieve the necessary precision with this method.

Most candidates cropped and resized the ocean layer correctly but many did not pay sufficient attention to matching the position of the ship and the horizon as shown in the question paper. As with all graphics tasks, accuracy and precision in matching the example and specifications shown in the question paper was important.

The question paper showed the castle with all other areas removed. Candidates were required to save three layers separately but some candidates only attempted to remove the land and leave the castle and the sky intact. Each layer, castle, ocean and sky, was needed to gain marks. It is also important to note that a large number of candidates left the individual layers in the proprietary format of the application they used. These layers could not be assessed in those formats. Fortunately, almost all candidates saved the final composite image correctly and most of the marks for the individual layers could be awarded at that point.

It is important, however, that candidates are aware that images must not be submitted in application specific formats.

Task 2 – A mail merge problem

The start of this task was challenging for most candidates. The task stated that candidates must use a database to collate and configure all the data necessary for the mail merge. The specifications for the merge were described in the question paper and the layout and inclusions shown in the mail merge template. The data as provided was not consistent with the requirements of the merge and candidates had to determine which fields were necessary by inspection. Very few recognised the salient issues and attempted a suitable method to gather the data needed.

There were two elements to the data that needed to be determined by inspection. The first was that 5 customers had not paid the bill for March and that a sum of the orders placed in April was needed for each customer. The data required for these elements was contained in two worksheets. The data for the March amounts was contained in the 1st_quarter_accounts worksheet with the unpaid accounts highlighted. The data that needed to be totalled for each customer was listed in the April-orders worksheet.

Inspection of the mail merge requirements should have led to candidates recognising that the source needed to be comprised of records for only the 43 account holders with fields for the total for March, whether the March bill had been paid, the total of the April orders with a field for the outstanding bill which needed to include the March total if it had not been paid.

Importing data into a database was required by the task and manipulating the data in the spreadsheet was not a suitable method. Queries would enable candidates to total the April orders for each customer and create a source that combined the data necessary for the mail merge.

Many candidates tried to combine the data in the spreadsheet and whilst some managed to configure some of the fields correctly, none created a suitable data source for the mail merge. Of those who did use a database and create queries, only a handful were completely successful.

There were two merges necessary for the task. The first was for letters to the five customers who had not paid their March bill. The data needed to include the total of the orders in April, the unpaid amount for March and the total therefore outstanding. Almost no candidates successfully created the required letters. A few listed the March amount and the April total as separate amounts. The letters were, therefore, incomplete but this method did gain some marks.

The second merge was for only the four customers whose total for April was £300 or more. This was a slightly easier merge but obviously only those who had managed to create the totals configured the document successfully.

Task 3 – Animation

The only part of this task that candidates found difficult was determining a method that enabled the background image to appear dimmed as the circular viewer tracked across the frame. This was possible by creating a semi-opaque rectangle much larger than the frame with a circular 'hole'. It was the rectangle that needed to be animated, not just the circular viewer. Very few realised this but almost all managed to create an animation that followed the correct path.

The requirement to 'zoom' in on the lighthouse at the end of the animation seemed to be an area of difficulty and very few managed this successfully. This is a common feature of animations and centres would benefit in setting practice tasks that include this aspect.

There was no requirement for the animation to 'loop' and restart. Candidates must consider the task requirements carefully. If the question paper does not instruct candidates to ensure the animation loops indefinitely, the animation must finish and remain on the final frame. Almost all candidates made their animation loop indefinitely. This may have been due to a default setting in the application, so candidates need to be aware of the need to look for the setting before the final export of the animation.

Task 4 – Programming for the web

An important issue with this task was the use of an external JavaScript file. Copying the code and pasting it into the html page was not what the task required. The task specified the candidates should 'Amend the *TreeHeight.html* page to use the *TH.js* script.' As in previous tasks candidates need to be aware of the need to use external scripts in their solutions.

Many candidates did manage to provide appropriate code and whilst several submissions did not work properly, most of these candidates were able to gain a fair number of the marks.

One common issue that prevented solutions from working properly was that many failed to remember that in JavaScript, data from the input boxes would initially be recognised as text and for this task, it needed to be converted to numbers.

The addition of a button to clear all the data proved no problem for most but very few managed to make the code it invoked clear the input boxes. The simplest method to achieve this was to use the Window Location object. Using `onclick= "location.reload()"` was an effective solution.

A number of candidates managed to create a completely working solution but only one or two of those managed to display the height of the tree rounded to a maximum of 1 decimal place. Rounding numbers is an area that centres would benefit from providing practice for students.

In conclusion

For this session, the main issues for centres to bear in mind are that candidates need:

- the experience of challenging tasks that develop problem-solving skills

- practice in the use of layers, selecting objects and the use of colour range tools in graphics tasks

- to be reminded that images and animations must not be submitted in application specific formats

- practice with 'zooming in' on objects or areas in animations

- experience of using external .js files in programming for the web

- practice with the use of numbers in JavaScript and rounding to a specified number of decimal places.

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