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.

Candidates are reminded that answers need to be legible. Whilst the number of illegible answers remains very small, and every effort is made to read them, where answers can not be read, Examiners are unable to give marks.

Candidates are also reminded that this examination is intended to assess their knowledge of Information Technology to a high level of understanding. Therefore, it is a reasonable expectation that candidates will be able to use technical terms from across the syllabus accurately and employ suitably technical terms in their answers. In a small number of cases, candidates use slang terms as part of their answer. Whilst those in common use, and outside the realms of the syllabus, such as 24/7, are acceptable, candidates should avoid using slang terms to answer technical questions.

General comments

There has been a marked improvement in how candidates respond to key words and context in their answers. Context defines the framework within which questions are set, and are to be answered, whilst the key words define what the answer needs to do. For example, a question that requires candidates to describe will differ in challenge and requirement to one that asks candidates to justify. For the former, candidates are asked to identify and give further information about the aspect on which the question focusses, whilst for the latter, candidates are asked to give arguments or reasons in support.

However, even with this improvement, candidates are still missing the point of some individual questions. See below for details.

Comments on specific questions

Question 1

The first question focused on the factors that affect the quality of information gathered. Candidates were asked to describe **two** factors that affect the quality of information. This question was answered extremely well, although some candidates did appear to be somewhat confused over aspects such as age of the information, and confused the issue of age with age of the candidates.

Question 2

This question exemplifies the need for candidates to answer the question as set.

The context for this question was the need to record members' details at a gymnasium. Candidates were told that the owner of the gym was unsure of whether to use a spreadsheet or a database for the task. Candidates were then asked to discuss the drawbacks and benefits of using a spreadsheet for this purpose.

As such, there was no requirement for candidates to consider the use of database software in this answer, however, the answer had to be related to spreadsheets being better or worse. Therefore, simply stating that a spreadsheet could, for example, create a graph from the data input was a statement of fact, rather than a comparison. Unfortunately, this answer typifies the answers that were given, and, only in a small number of cases did candidates provide comparative statements. Had the question asked candidates to identify features of spreadsheet software, far more marks would have been awarded.

Question 3

This question asked candidates to describe four ways in which a firewall increases security of personal data. Therefore, the question was fundamentally assessing candidates' technical understanding of the firewalls.

Typically, candidates do not do well on questions that require technical understanding, and the answers to this question did not buck this trend. Where candidates did achieve marks, these were typically for identifying that a firewall checks IP addresses and reacts accordingly, and also a generic statement that the firewall identifies threats, which was awarded with a degree of leniency.

Question 4

This question was another where context played a large part in the answers. Candidates were asked to reflect on the use of microprocessors to control devices in a smart home.

Typically, candidates focused on the use of microprocessors in general and did not address the issue of the use of microprocessors to control devices in a smart home. Candidates would often give long and involved answers about the interaction between microprocessors and sensors, but neglect to link this to a smart home. Other candidates described how microprocessors had limited processing power and attempted to link this to controlling devices around the home, when in fact, the question was about the use of microprocessors to control devices and the implications of that.

Typically, marks were awarded for an awareness that the use of microprocessors in smart homes used increased electricity or could lead to unforeseen outcomes based on miscommunication with devices.

Question 5

This question focused on why a manager would choose off-the-shelf software. This was generally well answered. Candidates were able to identify issues to do with cost, testing and the availability of features in off-the-shelf software.

Question 6

This question focused on the digital divide. Typically, this area of the syllabus lends itself to a wide variety of answers, some of which are quite unsupportable.

The first aspect of this question asked candidates to identify an affected group of people. To achieve this mark, candidates had to fully identify the group.

All candidates attempted the question, and many were able to identify an affected group, such as young and old people. However, defining the term proved slightly more difficult. Candidates were able to identify that the digital divide was linked to differences in access to resources, but few also stated that the divide was caused by differing levels of access to information.

Question 7

This question came in two parts. The first focused on the use of sensors to collect weather data and the second focused on how that data could be processed.

(a) This section proved to be of little challenge to most candidates. Marks were awarded for the identification of sensors and then stating how they may be used. In many cases, candidates received full marks for this section.

(b) ***Section B*** of the question presented more of a challenge to candidates, despite the mark scheme being quite wide. Candidates were able to answer by focussing on the way the data could be processed, such as how it could be converted to useable data via the use of an ADC, or could focus on how the data could be used, or a combination of both.

Typically, marks were awarded for answers about graphs being created, or data being used to predict weather patterns. Very few candidates gave technical answers about how data captured by sensors could be processed to be used by a computer system.

Question 8

This question required candidates to describe the process of transferring funds electronically, following a purchase by a customer.

The key to this question was focus and accuracy. Whilst many candidates were able to give generalised descriptions about how money may move from one account to another; these descriptions were often extremely vague. For example, candidates would describe sums being moved from one account to another, without any indication of which account was the source, and which was the beneficiary. Similarly, candidates would state that the system checked if sufficient funds were available before the exchange can take place, without any indication of which account would be checked.

As indicated above, the key to such processing question is clarity and accuracy. If candidates are describing a value or a number being considered, they must be absolutely clear to which value or number they are referring. Without this clarity, answers are too vague to be awarded marks.

Question 9

Candidates were asked to identify and improve a flow chart. Candidates were provided with an answer space, but could answer on the original chart. However, candidates are warned that answering on the chart and on the answer space can cause confusion, especially where answers are contradictory.

This area of the syllabus has seen a real improvement in understanding over the last few sessions and answers to this question followed that trend. The vast majority of candidates were able to identify issues with the flow chart, and a fair proportion gave clear improvements.

When candidates are describing an improvement to the physical structure of a flow chart, such as the need to change where a line meets the chart, candidates need to be extremely clear about which line is being removed, and how it is to be replaced. This is one instance where answering on the chart itself may be beneficial. In which case, as simple statement of ‘please see amendment to the chart’ or similar, will give a clear indication of how the candidate has answered the question.

Question 10

This question focused on different types of database queries. This required a fair degree of technical understanding, as, in each case, candidates had to provide an answer that was fundamentally a definition of each query. This proved to be a challenge to all but a few candidates.

Question 11

Variations on this theme of question have been asked many times over the past few sessions. In this iteration of the paper, candidates gave some good answers. However, as with the question about spreadsheets above, candidates had to answer with advantages and disadvantages, rather than just features. So, for example, checking line by line was not sufficient, but the concept of finding errors more quickly, which is a consequence of checking line by line, was awarded.

Question 12

This final question focused on the use of test data to test a validation rule used in a spreadsheet. Candidates were provided with the type of test data to be used and then had to suggest the data to be used, and the expected outcome.

The majority of candidates coped with this question very well. However, a significant minority believed that extreme data was unacceptable. Other than this issue, candidates clearly understood the role of test data and how the validation rule would cope with each type of test data.

INFORMATION TECHNOLOGY

Paper 9626/12
Theory

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General comments

There has been a marked improvement in how candidates respond to key words and context in their answers. Context defines the framework within which questions are set, and are to be answered, whilst the key words define what the answer needs to do. For example, a question that requires candidates to describe will differ in challenge and requirement to one that asks candidates to justify. For the former, candidates are asked to identify and give further information about the aspect on which the question focusses, whilst for the latter, candidates are asked to give arguments or reasons in support.

However, even with this improvement, candidates are still missing the point of some individual questions. See below for details.

Comments on specific questions

Question 1

This question focused on the benefits and drawbacks of using indirect data sources.

(a) ***Section A*** focused on the benefits of getting data from indirect data sources. Candidates coped with the question quite well. Most common answers were that the data was readily available which allowed data to be gathered from a wider source. Some candidates tried to base their answer on data being cheaper, which is not necessarily the case as much indirect data has to be purchased. However, where candidates stated that a specific, named, cost could be avoided, this was awarded.

(b) ***Section B*** focused on the drawbacks of obtaining data from indirect sources. Again, this was quite well answered, although there were some common misconceptions. For example, data obtained from indirect sources is no more likely to be biased than data collected from direct sources. It is also no more or less likely to be accurate.

Question 2

This question was based on a spreadsheet of which the candidates were given a screenshot.

(a) The first question asked candidates to describe how a specific formula in the spreadsheet worked. Candidates were able to give a technical answer based on the specific parts of the formula, or a descriptive answer on what was occurring. For this second choice, there was a basic benchmark that candidates had to cover, so, for example, they had to refer to the range D5 to D8 as where the match for the original look up value was found.

Approaches to the answer were probably evenly split. Both approaches were equally successful, and many candidates achieved full or very high marks for the question.

(b) The second part of the question focused on why absolute cell referencing and relative cell referencing were both used in the spreadsheet. Again, candidates could adopt two different ways to answer this. The first was to give an answer based on why both forms of referencing were used, and the second was to consider each form of referencing individually.

Candidates did quite well on this question. Most candidates decided to go down the route of dealing with each method individually. Most were able to describe each method but were not sufficiently clear about how each was used in the spreadsheet.

Question 3

This question focused on the components of expert systems. Candidates were asked to describe the roll of the user interface and the inference engine.

Virtually all candidates attempted these questions and many scored well. Where candidates suggested that the Inference Engine provided a diagnosis, this was not awarded, as this was a repetition of the question.

Question 4

Candidates were asked to compare the use of off-the-shelf and custom written software.

Candidates' approach to questions where they are asked to compare has improved over recent series, and whilst candidates do have to show some awareness that they are comparing, there is no requirement for candidates to present both sides of the argument. In practice, candidates who did present both sides of the argument would simply write 'and X does not'. As long as the point made is a valid point of comparison, points will be awarded.

Question 5

This question asked candidates to describe five advantages of using a computer rather than a human being to monitor water pollution. Before discussing candidates' responses to this question, it is worth stressing that computers do not carry out the process of collecting data. This is the role of sensors.

Unfortunately, a large number of candidates effectively compared the use of humans with the use of sensors, either by discussing sensors directly or by treating computers as though they were computers. Candidates claimed, for example, that the computerised system would take more accurate readings than the human one, whereas, in reality, the readings would have been taken by a sensor. Whilst there is an answer to be given about accuracy – for example stating that the use of computers reduced the possible impact of human error, the accuracy of the initial reading is not relevant.

In general, candidates need to be clear that the advantages they identify are strong advantages. For example, stating that a computerised system is cheaper than a human based system is based on supposition about costs of purchase, rates of pay and other financial considerations. No details were given about these figures in the question, and, conceptually, they are probably beyond the remit of this qualification.

Question 6

This question focused on the network manager job role. Many candidates approached the question as though it was an individual who happened to be a network manager and therefore suggested ways in which an individual could reduce the chance of malware entering the network, rather than how a job role could reduce the chance of malware entering the network.

Other candidates seemed confused using the term 'malware prevention software' in the stem of the question and suggested that one further way in which a network manager could prevent malware from entering the system was to install anti-virus software. This was incorrect. However, candidates could state that keeping anti-virus software up-to-date.

Question 7

This question assessed candidates' understanding of the concept of indexed sequential access. Unfortunately, it showed that very few candidates indeed had any real understanding of this term.

Question 8

This question was another that assessed candidates' technical understanding. In this case, candidates were asked to describe what is meant by an actuator and give an example of an actuator.

Virtually all candidates attempted the question, and many gave answers that vaguely described what is meant by an actuator, but these vague answers often missed the basic concept that an actuator turns a signal into an action. Similarly, few candidates were able to give a suitable example.

Question 9

This question was less technically demanding that the previous two, and this is reflected in the scores achieved. Candidates were required to suggest reasons why a spreadsheet that had been shared amongst a group of friends could not be opened by some of the group of friends. The key point here is that whilst some of the group of friends could not open the spreadsheet, others could. Therefore, there was no inherent flaw with the spreadsheet, but rather individual conditions that meant some could and some could not open the file. Acceptable answers included that the spreadsheet was password protected, but only some friends had been given the password, or that different friends had different types of software.

Answers to this question were strongly affected by the use of Trade Names. As indicated above, this reduced the marks scored by candidate where the removal of the Trade Name from the sentence made the answer nonsensical.

Question 10

This question required candidates to evaluate the use of dialogue interfaces in homes. Candidates in general coped very well with this question. Answers were grouped into the concept of voice control and lack of physical touch, with some answers being only available if these concepts were given as a starting point. Typical candidates stated that dialogue interface was based on voice control (any awareness of voice control was sufficient for this to be awarded) and that this was beneficial to candidates who suffered from a disability.

Candidates tended to concentrate on the positive implications, rather than both the positive and the negative, and this did restrict the overall marks scored for this question in a few cases.

Question 11

This question focused on validation checks on a the CandidateID field of a database. Candidates were provided with a part of the database as a sample.

Many candidates scored full marks for this question. Where candidates did not achieve full marks, this was often because they chose to focus on a different field in the database, or suggested type check as an answer.

Question 12

The key features of this question about the use of mainframe computers in a bank was the key word being ‘explain’ and the context of being used in a bank.

When faced with a context, candidates must ensure that the context features clearly in their answer. By stating, for example, that mainframes have minimum downtime, candidates are describing a feature. This is not an explanation of why mainframes are used by banks. Candidates need to consider the features of mainframe computers and apply them to banking. Simply put, why is the fact that mainframe computers have minimum downtime important to banks for transaction processing?

Many candidates stated benefits of mainframe computers. Had candidates linked these concepts to the needs of banks, these would have been good answers. However, many candidates simply did not mention banks, in which case they did not answer the question, whilst others did attempt to link the benefit, but did not state why it is important.

Question 13

This final question about the benefits and drawbacks of using encryption when transferring data between web browsers and web servers produced mixed results. Some candidates produced answers that covered benefits and drawbacks in some depth and scored well. However, others gave quite weak answers that failed to achieve marks.

One point about encryption that bares repetition is that encryption does not render data unreadable. It is readable, as it is made up of an alphabet, or series of characters, with which the reader is familiar. Rather, encryption renders data unintelligible. This therefore makes it useless to any third party who intercepts the data, which in turn reduces the motivation of would-be hackers to steal the data. Therefore, users of the service that has been encrypted feel more confident.

INFORMATION TECHNOLOGY

Paper 9626/13
Theory

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General comments

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However, even with this improvement, candidates are still missing the point of some individual questions. The level of technical understanding of the syllabus was not strong. Questions that assess technical understanding of the syllabus are a core and constant feature of this examination. Almost without exception, any question which was based on a technical understanding was badly answered. See below for further details.

Comments on specific questions

Question 1

For this question, candidates were told that observation was one method by which direct data could be collected and were asked to identify and describe two further methods.

The task of identifying two further methods of collecting direct data proved to be little challenge to candidates, other than for those who suggested 'surveys' as an answer. However, in a few cases, candidates' description of the method was too vague to be awarded. For example, interviews do more than ask questions. The key aspect of an interview is that the questions are asked by an interviewer, or the meeting is face to face/in real time.

Question 2

This question focused on the use of TLS/SSL. This proved to be quite a challenge for some candidates, which is typical of questions which are based on technical understanding. Where candidates achieved marks, this was typically for an understanding that TLS/SSL used encryption. However, there was a significant number of candidates who were fully able to describe ethe use of TLS/SSL.

Question 3

Candidates were asked to describe the reasoning used in an inference system. This required some technical understanding but was structured so that candidates could answer from several different starting points.

Typically, candidates identified forward and backward chaining and IF….THEN analysis. For many candidates, this was the limit of their answers, but a significant proportion of candidates gave full answers that further developed these points to good effect.

Question 4

Question four assessed candidates' understanding of the term 'trojan' as a form of malware. Candidates scored well on this question, with many achieving at least two marks. A large proportion of candidates mentioned that the term came from the Trojan War, which is an interesting side point about this form of malware, and helps candidates who also have a knowledge of the Trojan War to remember how a trojan works but is extremely unlikely to be worthy of a mark on this exam.

Question 5

Question 5 is the first question in the paper where a significant number of candidates failed to interpret the question correctly. The question asked about types of test data. For those candidates who interpreted the question correctly, this was a straightforward question. The justification for the use of any test data is the outcome of that test and why it is important. Therefore, for example, the use of extreme data tested that numbers on the extreme of the acceptable range were not rejected.

However, other candidates misinterpreted the question and focused on methods of validation and, occasionally, verification.

Question 6

This question came in two parts. Both focused on why specific edits were applied to a video. Such questions can be very much open to interpretation and so the mark scheme was open for both questions. Candidates gave a wide range of answers, but where these fitted the key concepts of fading and captions, marks were awarded. Overall, this was a question where candidates cored well.

Question 7

For this question, candidates were given the rules used to process test marks for a class and asked to write an algorithm.

Algorithms represent one of the key areas of improved performance over the past few exam sessions, and the answers were no exception to this pattern of improvement. Many candidates scored full or near full marks.

Having been told to use the REPEAT……UNTIL structure, most candidates realised that the algorithm required a count and that this count should be initialised outside of the loop. However, a sizeable minority placed the initialisation of the count within the loop. This was the most frequently made mistakes amongst candidates who otherwise had a strong understanding of what was required. Other common mistakes made by candidates from this group included treating the test criteria as a string and using the structure IF X>Y and <Z, instead of IF X>Y AND X<Z.

Centres are reminded that CIE has produced a pseudocode guide for teachers and candidates working on this course. This guide gives clear examples of how the pseudocode structures to be used with the course.

Question 8

For this question, candidates were told that interpreters and device drivers were types of system software. Candidates were then asked to describe the functions of a device driver and justify the use of an interpreter. Due to the command words, these were quite different questions.

(a) For the description of the functions of a device, the use of the plural in the question meant that candidates had to give more than one answer. Therefore, they could describe four individual functions or two in some depth, or three with a mixture of techniques.

Most candidates failed to score above two marks for this question, with a sizeable proportion of candidates scoring either 1 or 0. Where candidates scored marks, this was usually for stating that a device driver provides the interface between the device and the computer and that this allows the computer to control that device. Few other relevant points were made.

(b) ***Section b*** of the question required candidates to justify the use of an interpreter. To justify, candidates must give arguments in favour of a particular argument or decision. To justify the use of an interpreter, candidates had to have a range of benefits of the use of an interpreter. This is therefore less demanding than a question where candidates are asked to explain why an interpreter would be used.

Candidates also struggled with this question. In some cases, there was a lack of technical understanding, whilst in others, answers were vague and lacked clarity. Statements such as ‘the interpreter translates the code to match the computer language’ were on the border of acceptability, but it is reasonable to expect slightly more technical understanding of such concepts at this level.

Question 9

Questions such as this are a common feature of this examination, as they allow candidates the opportunity to show how well they understand processes. However, to be able to describe a process, candidates must understand that process and the component parts.

This question highlighted a significant misunderstanding of this oft used scenario. Candidates seemed to have little to no understanding of how an induction loop works and so wrote answers that, although long, often failed to achieve any marks other than a mark for identifying that the barrier opened or closed.

This highlights two points. Firstly, as indicated elsewhere in this report, candidates did not have a strong technical understanding of the concept and secondly, given this lack of understanding, candidates still benefitted from attempting the question.

Question 10

This two-part question again assessed technical understanding and again proved to be quite a challenge.

The question focused on the benefits and drawbacks of defragmentation. Whilst it was clear that many candidates knew what defragmentation was, there was a general inability to translate this understanding into a description of benefits or drawbacks. One common misapprehension was that defragmentation increased the storage capacity available, whilst other candidates stated that it improved security or 'refreshed' the hard drive. This final example is an example of an answer that is related to a correct answer but is far too vague to be awarded. If defragmentation improves the speed with which individual files may open, this could be interpreted as refreshing the hard drive, but to state that the hard drive is refreshed is too far away from the required answer. Unfortunately, such answers were typical of the answers seen for both sections of the question.

Question 11

Spreadsheets may be used for many purposes, including financial modelling, and this question focused on candidates' ability to identify arguments for and against the use of spreadsheets for this purpose. Clearly, this question therefore required an understanding of spreadsheets and of financial modelling.

Where candidates concentrated on financial modelling, they scored well. Standard answers were based on the use of formulae, charts and the ability to recalculate when new figures were entered. Typically, candidates gave more answers in support than against, but this was acceptable.

However, many candidates simply focused on what spreadsheets can do and failed to link this to financial modelling. Whilst some lenience was allowed, candidates who failed to make any mention of financial modelling struggled to score well on this question.

Question 12

This question assessed candidates' ability to provide definitions of key terms from the syllabus. The question itself focused on Compound keys and Composite keys. These are both keys which candidates should have met in their practical work. Unfortunately, very few candidates were able to give clear definitions of these keys.

Question 13

Candidates were presented with a flow chart that was intended to describe how a mean of 12 numbers is calculated. Candidates were told that some errors had been made in the flowchart and were asked to redraw the flowchart with the errors repaired.

This question proved again that candidates' ability to deal with logic-based questions has improved massively over the past few sessions. Many candidates scored extremely well. Where candidates did not achieve full marks, this was generally because they did not initialise the variable Sum.

In this question, candidates were clearly asked to redraw the flowchart. Candidates who amended the original flowchart and did not provide a new flowchart were therefore not answering the question.

INFORMATION TECHNOLOGY

Paper 9626/02
Practical

Key messages

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

- Candidates must save or export files with the specified file names and file types. File formats and file names not specified in the question paper will **not** be marked.
- Candidates need to make sure the spreadsheet is formatted as instructed in the question and that it also matches the formatting shown in the diagram(s) provided in the question paper.
- Candidates need to consider when to apply absolute and relative references within a formula in order to make it fully replicable.
- If a question requires the candidate to use 'a function' then only one function should be used and not multiple functions in the cell for their solution.
- Candidates must use the spreadsheet functions stated when they are specified in the question.
- Candidates need to understand the components and requirements of a test plan.
- Candidates need to select appropriate test data within their test plan selecting at least two elements of test data for each data type.
- Candidates need to be precise in their timings within a video, in terms of splicing clips and adding backgrounds or text to the clips.
- Candidates must follow the instructions on the question paper in relation to **not** using transitions unless instructed to do so.

General comments

Some candidates performed well on much of the paper but did not show in-depth knowledge of testing and test plans.

Most candidates performed well on the video editing task although many used transitions when instructed **not** to do so.

Comments on specific questions

Question 1

Most candidates successfully renamed the worksheet Teacher. Many added the file j25data.csv as a new worksheet within the workbook but not all renamed it Data. Most candidates successfully created a new worksheet called Finder, although there were some case errors when naming the sheets within the workbooks. A small number of candidates saved the file in csv format and not as a spreadsheet. Most candidates merged the cells as shown in the question paper, although a small number erroneously inserted text boxes rather than merging the required cells. Where candidates had merged and centre aligned cells A1:E1 and A11:E11, the majority added accurate large white sans-serif text on a black background. Occasionally a grey background shade was applied instead of black. There were a small number of typographical errors, particularly relating to the accuracy of text entry, often in the case of the text. Not all candidates centre aligned the text in row 12. Most candidates right aligned the text in the unmerged cells within column A and enhanced the cells A3 and A4 by emboldening them.

Question 2

Many candidates successfully placed the correct date in cell B3 although a significant number omitted to format this cell as specified in dd mmmm yyyy format. In the validation rule many set the date parameters as specified but the appropriate error messages displayed in candidates work was frequently lacking in detail, particularly when explaining to a user that their attempted data entry was not valid or how to correct their entry so their next attempt would pass the validation test for this cell.

Question 3

Many candidates successfully placed a validation rule in the required cell that looked up acceptable teacher's names from a list. Many did this without editing the teacher worksheet and used a range of $B$2:$B$29 but some edited this file and set the teacher names in column A and successfully gained both marks.

Question 4

This question required the candidates to 'look up' the code so solutions using functions such as IF or IFS were not appropriate. The use of an appropriate formula for cell B6 depended upon whether the candidate had edited the data in the teacher worksheet. If they had not changed the data reversed referencing (from column B back to column A) was required which could only be completed using a LOOKUP or XLOOKUP function. Excellent solutions using formulae like =LOOKUP(B4, Teacher!B2:B29, Teacher!A2:A29,) or =XLOOKUP(B4, Teacher!B2:B29, Teacher!A2:A29,) were seen. Candidates who did not edit the data and used functions such as VLOOKUP attained no marks as this function was not appropriate for the data presented. Candidates who had edited the data (in some cases swapping the data in columns A and B in the Teacher worksheet) were credited for using a VLOOKUP function with the correct range and return column.

Candidates are not normally allowed to edit data to make the functions they have selected work, but as question 3 stated 'The Teacher worksheet can be edited if required.' on this question it was allowed. Some candidates took this as license to subsequently edit the Data file to try and make other questions easier but no credit was given for answers where this had been attempted. Likewise, no credit was awarded where candidates had used external data files rather than the worksheets within their workbook. Credit was not given to references to worksheets that did not use the specified sheet names.

Question 5

A number of good responses were seen in cell B7, the most common response was =WEEKDAY(B3), although other correct answers such as =WEEKDAY(B3,1) or =WEEKDAY(B3,17) were also observed. The most common error seen was =DAY(B3).

Question 6

A considerable number of different responses were seen to this question. Many correct solutions such as =TEXT(B3,"dddd") were seen. Some candidates attempted to format the cell as specified but this did not meet the requirements of the question. Some candidates creatively used the data in the Data worksheet to complete this question with solutions such as =INDEX(Data!$B$2:$H$2,B7), =LOOKUP(B7,Data!B3:H3,Data!B2:H2) and =XLOOKUP(B7,Data!B3:H3,Data!B2:H2) seen. Similar solutions where candidates had edited the Data file did not gain the candidates any credit. The question said 'place a function' so a single function (not multiple functions) was required. Solutions using nested IF statements were therefore not credited with marks, but a small number of candidates used solutions like =IFS(B7=1,"Sunday",B7=2,"Monday",B7=3,"Tuesday",B7=4,"Wednesday",B7=5,"Thursday",B7=6,"Friday",B7=7,"Saturday") which did use a single function.

Question 7

This question was well answered by many candidates although some candidates mixed up the row and column numbers of the INDEX by reversing the MATCH statements. There were also a number of candidates who did not use the correct ranges.

Question 8

Many candidates used either a VLOOKUP or XLOOKUP but fewer candidates used a replicable MID function, many opting for a LEFT function to cell B9, but this only worked for cell B13 and not the cells in columns C, D and E. Some candidates used the MID function but did not set the reference to B9 as an absolute reference so that this could be replicated correctly. Some candidates attempted to use the LOOKUP function, but the data was not sorted into order making this function inappropriate. Due to these factors few candidates replicated this cell correctly.

Question 9

Many candidates correctly used either a VLOOKUP, LOOKUP or XLOOKUP but fewer candidates used a replicable MID function, many opting for a LEFT function to cell B9, but this only worked for cell B14 and not the cells in columns C, D and E. Some candidates used the MID function but did not set the reference to B9 as an absolute reference so that this could be replicated correctly. The use of the LOOKUP function was appropriate for this cell as the data was sorted into alphabetical order. Replication also proved challenging on this question.

Question 10

A large number of candidates did not attempt this question. Of those who attempted this question, a significant number of candidates placed a replicable formula using the MID function into cell B15, although less replicated it correctly to cell E15.

Question 11

Candidates often omitted this step in their formulae, but most of those who attempted it did use a formula to mask out the data or error message if there was no data to display. A small number of candidates attempted this with formulae in conditional formatting for the cells but this was not credited as the question paper instructed candidates to ‘Edit the formulae in cells B13 to E15’ and conditional formatting did not meet this criteria.

Question 12

This question was challenging to a number of candidates who made no attempt to use formulae to hide each of these cells. Most candidates who offered a solution gained both marks.

Question 13

This question proved challenging to many candidates. Some did not attempt it whilst others did not demonstrate knowledge of a test plan’s structure or data selection. The test plan should always identify what is being tested, in this case the validation rule placed in cell B3 but few candidates identified both of these critical pieces of information. Test plans should be tabular, and columns should have been created to identify (as a minimum), the test data identified, the type of data being tested and the expected and actual outcomes. Few candidates included all these columns but many who had used a tabular structure had a column for test data. The selected test data should be the only element in this column, examples of incorrect data such as ‘Enter 13/3/2025 to test’ were seen, where only the data 13/3/2025 should be present in this column. In the test type column normal, abnormal and extreme data should have been identified but was infrequently seen by Examiners. Test tables should always contain all data extremes (in this case 1/1/2025 and 31/12/2026) but sometimes only one of these values was present. In reality a large number of items of test data would be used for normal and abnormal data types, but Examiners only checked that two of each type were present. Most candidates who attempted this question set appropriate expected results and used screen shot evidence of the actual test results.

Question 14

Most candidates completed this task well, successfully setting the aspect ratio to 16:9, but not all of them retained the 854 × 480 resolution. Most candidates trimmed the video clip so that it ended after 8 seconds. Candidates often zoomed in from 3 seconds onwards but they did not always ensure that the anemone and second clownfish were always fully visible. Most candidates exported the video into mp4 format as instructed but a surprising number of candidates exported in other formats such as .mov, .avi, and .wmv. Please note that Examiners can only mark the file formats specified in the question paper.

Question 15

Many candidates completed this task well. Many placed the two clips in the correct order although the transition was not always added and a large variety of transition styles were seen, not just the required dissolve style. A number of candidates found changing the speed of the video clip as specified more challenging with some candidates omitting this step. Like **Question 14**, most candidates exported the video into mp4 format as instructed but a significant number used other (unmarkable) formats or used a different resolution.

Question 16

Most candidates completed this task well. The initial image extracted from the first frame of the video was frequently correct, but candidates were either successful with getting their timings to match the storyboard or added (unwanted) transitions to text so it was impossible to mark the timeline. There appeared on the part of some candidates, to be little recognition of titles sitting above sub-titles and being larger and/or more prominent than sub-titles. The accuracy of data entry was also an issue for a small number of candidates.

The credits were sometimes not started at 30 seconds, even where other timings were correct. There was little text entry to be placed in the credits, but a significant number of candidates made typographical errors in this text. Sometimes the timing of the scrolled credits meant that the text entered could not be read before it had exited the frame. Most candidates exported the video into mp4 format as instructed but a number of candidates exported in other formats such as: .mov, .avi, and .wmv or saved it in in package specific formats such as .wlmp or .pproj.

INFORMATION TECHNOLOGY

Paper 9626/31
Advanced Theory

Key messages

Many candidates demonstrated good subject knowledge in this paper. However, many candidates produced responses with insufficient detail to gain credit or did not properly address the command word in the question. At A Level, candidates are expected to write responses with significantly more detail than single word lists or very brief statements. Centres must ensure that candidates are able to customise their responses according to the command words (shown on p.66 of the current, 2025 – 2027, syllabus) in the questions. Candidates who write answers that do not address the command word do not have access to the full range of marks.

In Paper 3, questions can be set on any, and all, areas of the A Level topic syllabus so centres are reminded to ensure that their candidates study all the content of the subject topics. The syllabus (p.13) also states: 'where the term 'including' or 'for example' is used, everything listed must be studied. 'Including' refers to content which is being considered as part of that topic point. 'For example' illustrates a typical case. The lists are not exhaustive and other relevant and related aspects should also be studied.'

Centres should remind their candidates that the number of marks available for each question is an important indicator of how much detail or how many descriptions should be given in the answers.

General comments

Centres should remind their learners to read the whole question carefully before attempting to write their answer. The full range of marks is only available to learners for answers referring to the question scenario. For example, **Question 7** was about the benefits and drawbacks of data mining at the process of data mining. This is to ensure that they understand exactly what the question is asking and not write answers based solely on 'key' words that they have 'spotted'.

Candidates should be encouraged to write answers in full sentences. Answers with bulleted, short statements for free response questions, especially those requiring analyses, discussions and evaluations do not adequately answer the question. Furthermore, if these answers are shown in a sketched table, they do not properly answer the question as there is no discussion.

Candidates should not repeat the question in their answers. For example, **Question 10 (a)** asks for 'other drawbacks', but a significant number of candidates included the drawbacks mentioned in the question in their answer, which did not gain them credit.

This series showed a marked deterioration in the standard of handwriting and presentation of answers. Examiners make every effort to read and interpret a candidate's handwriting but where the writing is illegible marks cannot be awarded. Further, repeated crossing-out, rewriting answers with arrows joining portions of an answer that is spread out into other response areas and over the white spaces of a question paper do not make it easy for Examiners to mark the answers. It was also noticeable that answers that were word processed lacked punctuation, sentence structure and even the simple requirements of numbering the answers to match the question. Centres are requested to remind candidates that answers to questions will only gain marks if they can be read and understood by Examiners.

Comments on specific questions

Question 1

Answers to questions that ask for an explanation should include a statement and a reason. There was some muddling of answers between the two parts of this question. Centres are advised to ensure that their candidates read the questions carefully.

(a) A good answer to this question made a statement about a test plan and then gave a reason. Answers that were brief and did not address the question, e.g. describing details of test data, were not given credit.

(b) Answers that gave examples of test data were unnecessarily complicated. The question asked for 'types' of test data so good answers referred to normal, extreme and abnormal data but could have included blank and manually-generated data.

Question 2

The command word 'analyse' requires candidates to examine a topic in detail (p.66 of the current syllabus) so answers should have been more in-depth than statements or descriptions. Credit was given for a precise explanation of the waterfall method and for describing the stages where these were part of a wider analysis. Most candidates could describe the method and the stages, but the better answers were those that went into greater and more accurate detail about using the method to develop a new app.

Question 3

(a) Responses that were brief and did little more than state facts about MAC addresses did not properly answer the question. When answering questions of this type, candidates should take note of the number of marks available as the full mark range is only available for answers that include sufficient details.

(b) This question required an explanation of why a laptop is unable to communicate directly with laptops on a different logical network. To be awarded both of the marks available, it was necessary for candidates to identify the network difference and then explain how this prevents direct communication.

Question 4

Candidates should not repeat the question in their answers. The addition and subtraction operators were given in the question so these should not have been included in answers to **part (b)**.

(a) (i) Most candidates could correctly describe how this operator is used in JavaScript, but a common mistake was to describe this as the addition operator.

(ii) Most candidates could correctly describe how this operator is used in JavaScript, but a common mistake was to describe this as being used to multiply multiple values together.

(b) Many candidates could describe two other arithmetic operators. Common mistakes were to describe comparison operators instead If arithmetic operators or to inaccurately describe the operators e.g. / was described as a backslash when it is a forward slash.

Question 5

(a) Most answers to this question did not show an understanding of the effect of drawing animation objects on 1s, 2s or 3s. Responses inaccurately referred to the difference in apparent speeds of objects drawn on 2s and 3s or inaccurately to the apparent smoothness or jerkiness of the object. Some valid references to the reduction in the number of frames that have to be drawn were seen.

(b) Despite inaccurate references in **part (a)**, some candidates were able to accurately point out that drawing on 2s creates an apparent smooth motion of objects and removes the need to draw on every frame.

Question 6

(a) There was considerable confusion between the functions of the internet layer and other layers. Answers to technical questions need to be accurate and precise in their details.

(b) This question required only a name or acronym of a protocol that works at the internet layer. A common mistake was to identify a protocol that works at a different layer.

(c) This question produced more correct answers than **part (b)** but, again, a common mistake was to identify a protocol that works at a different layer.

Question 7

This question required candidates to discuss (see p.66 of the syllabus for a definition of the command word 'discuss') both benefits and drawbacks of data mining. Candidates could not, therefore, be awarded the full marks without reference to both. While most candidates gave some good answers, there were many who made mistakes such as describing the stages of the data mining process or confusing data mining with another topic altogether, e.g. prototyping.

Question 8

This type of technical question requires answers that are precise and accurate in detail if the full range of marks is to be accessed by candidates. The process of fetching and displaying content from a web server by a web browser is an example of 'request-response' (Topic 14.3, p.39 in the syllabus) so it was expected that candidates would have studied this. Where technical details are required, vague answers e.g. 'uses the internet' will not gain credit.

Question 9

The internet of things (IoT) is an emerging technology (p.37 and p.42 in the syllabus) and while most candidates could describe its use in healthcare in **part (b)**, few could produce a precise description of the IoT for **part (a)**.

(a) There was confusion between the IoT and the information that can be found on the internet. A good answer would have included a reference to the devices and to their interconnection.

(b) This question produced some good answers with many candidates describing valid examples of the uses of the IoT in healthcare.

Question 10

Some candidates included the items given in the question as part of their answer. Where a question asks for 'other' items, any repetition of those in the question will not gain credit.

(a) Answers about the benefits or uses of blockchains did not gain credit as these were not required for this question.

(b) The use of blockchains in smart contracts was not well understood. Topic 13, p.37 of the syllabus, requires candidates to be aware of emerging technologies and their impact on organisations. Blockchain technology is one of those emerging technologies.

Question 11

This question produced some good answers. Candidates were able to make valid statements about how video-conferencing is used in education and make valid judgements on its positive effects and suitability and on its negative effects.

INFORMATION TECHNOLOGY

Paper 9626/32
Advanced Theory

Key messages

Many candidates demonstrated good subject knowledge in this paper. However, many candidates produced responses with insufficient detail to gain credit or did not properly address the command word in the question. At A Level, candidates are expected to write responses with significantly more detail than single word lists or very brief statements. Centres must ensure that candidates are able to customise their responses according to the command words (shown on p.66 of the current, 2025 – 2027, syllabus) in the questions. Candidates who write answers that do not address the command word do not have access to the full range of marks.

In Paper 3, questions can be set on any, and all, areas of the A Level topic syllabus so centres are reminded to ensure that their candidates study all the content of the subject topics. The syllabus (p.13) also states: 'where the term 'including' or 'for example' is used, everything listed must be studied. 'Including' refers to content which is being considered as part of that topic point. 'For example' illustrates a typical case. The lists are not exhaustive and other relevant and related aspects should also be studied.'

Centres should remind their candidates that the number of marks available for each question is an important indicator of how much detail or how many descriptions should be given in the answers.

General comments

Centres should remind their candidates to read the whole question carefully before attempting to write their answer. The full range of marks is only available to candidates for answers referring to the question scenario. For example, **Question 6** was about creating a test plan and not about the actual process of testing. This is to ensure that they understand exactly what the question is asking and not write answers based solely on 'key' words that they have 'spotted'.

Candidates should be encouraged to write answers in full sentences. Answers with bulleted, short statements for free response questions, especially those requiring analyses, discussions and evaluations do not adequately answer the question. Furthermore, if these answers are shown in a sketched table, they do not properly answer the question as there is no discussion.

Candidates should not repeat the question in their answers. For example, **Question 4** asks for 'other selection tools', but a significant number of a candidates included the tools mentioned in the question in their answer, which did not gain them credit.

This series showed a marked deterioration in the standard of handwriting and presentation of answers. Examiners make every effort to read and interpret a candidate's handwriting but where the writing is illegible marks cannot be awarded. Further, repeated crossing-out, rewriting answers with arrows joining portions of an answer that is spread out into other response areas and over the white spaces of a question paper do not make it easy for Examiners to mark the answers. It was also noticeable that answers that were word processed lacked punctuation, sentence structure and even the simple requirements of numbering the answers to match the question. Centres are requested to remind candidates that answers to questions will only gain marks if they can be read and understood by Examiners.

Comments on specific questions

Question 1

Most candidates showed a good knowledge of the process of 3D printing and could answer **part (a)**, but the descriptions of the use of 3D printing in healthcare were lacking in detail.

(a) Technical details from the creation of the instructions to the final printed object were described by many candidates in some detail. There were, however, some candidates confused 3D printing with 3D imaging. This error was carried over into **part (b)**.

(b) This question was mostly answered well. There are many ways that 3D printing can be used to improve healthcare but there are limits to what can be produced and used. Answers that were outside of current medical capabilities e.g. printing whole new hearts or even, in some answers, new bodies, were not given credit.

Question 2

Many candidates confused network topology and architecture and muddled their answers for **parts (a)** and **(b)**. Some repeated answers across both parts.

(a) A common mistake was to describe the types of network topology, but these were not given credit. Good answers described a topology as being the physical arrangement of nodes (devices) in a network and the logical connections between them.

(b) Many candidates mentioned that the network architecture described the design and structure of a network, some added that it described the network protocols, but few mentioned the network services provided on the network. There are numerous types of networks listed in the syllabus (Topic 14.1, p. 38) and all have characteristic topologies and architectures, so candidates were expected to know and understand what these terms mean.

Question 3

Topic 14.2 Components in a network, p.38, in the syllabus includes wireless access points in the list of network components. Candidates are expected to know and understand how network components carry out their roles. This means that candidates should be able to describe or explain how a WAP does its job. The 'job' i.e. purpose was given in the question – 'enabling wireless devices to make a secure connection to a wired network' – and candidates were asked to describe how a WAP does this i.e. carry out its role. Vague, inaccurate answers referring to routers and Wi-Fi and IP addresses did not gain credit. This type of question requires accurate, in-depth technical details from candidates in order to gain access to the full range of marks.

Question 4

Centres are reminded to ensure that their candidates do not include examples that are already given in the question. Answers that described the colour select tool and its function did not gain credit. There are numerous selection tools available in bit map image-editing software and credit was given for identifying and analysing i.e. 'examining in detail' (p. 66 in the syllabus) the use of three such tools. In questions such as this one, it should be noted that there is little point in candidates writing about more than three tools because only three will score marks. The question clearly stated that answers should analyse the use of three tools, so the full marks were not available to candidates who did not refer to at least three.

Question 5

A significant number of candidates confused the term mobile networks with Wi-Fi/wireless LANs. The term mobile network refers to a telecommunications network that uses radio waves from base stations/towers to provide voice and data connectivity to devices in a geographic area.

Candidates were expected to write about the benefits and drawbacks of mobile networks in a structured way (see p.66 for the command word 'discuss') so answers that were given as bulleted lists or in tables of statements were not answering the question as set. While Examiners do attempt to give credit for such answers, there is usually little or no 'discussion' or expansion of the statements, so the full mark range is not

available to the candidate. This comment also applies to answers that have separate lists of benefits and drawbacks, but the lists consist of single word or very brief sentences. 'Discuss' questions require 'discussion' answers if they are to achieve the higher marks. Also, where both benefits and drawbacks are required by the question, answers that address only benefits or only drawbacks cannot achieve full marks.

Answers detailing the technical details of 3G, 4G and 5G were not required as the question did not ask for the comparison of different types or methods of mobile networks. Some level of accuracy is required in answers as mobile connections are not available 'everywhere on Earth'.

Question 6

This question is a good example of the necessity to read the question carefully. The question was about the creation of a test plan. It was not about the testing process that uses the test plan. Descriptions of types of test data, types of testing and evaluation were not required by this question. There was no requirement to write lengthy descriptions of normal, abnormal or extreme data or to describe white or black box testing as these did not answer the question.

Question 7

Most candidates could describe the basic, obvious differences between activity-on-node and activity-on-arrow PERT diagrams, but the similarities between the two were often omitted. A good answer should also have included comparisons between the two.

Question 8

(a) Most candidates could refer to the automatic generation of frames in between two keyframes.

(b) Most candidates could describe pixel mapping but to gain full marks the additional details of e.g. forward and reverse mapping, the generation of intermediate shapes and the concept of e.g. fading out and in to create the smooth change were necessary.

Question 9

(a) Most candidates could not describe the purpose of comparison operators but, instead, gave, often incorrect, examples of their use. A description was required, with the first mark awarded for the statement about the comparison and a second for either the reference to equality/inequality or to the Boolean result.

(b) The two comparison operators in the question, `===` and `!==` both test equality/inequality but have significantly different functions. Few candidates could accurately describe the difference and most muddled the two or gave examples that were incorrect. For full marks an accurate description of the difference was required.

Question 10

Distributed ledgers were often confused with, and assumed to be the same as, cryptocurrency. The topic 12.1, p.35 of the syllabus, indicates that candidates should study blockchains and distributed ledgers in the context of cryptocurrency, but it is expected that candidates would know the difference between them.

(a) As noted in a previous question, candidates should read the actual question and not write down answers triggered by keywords. Most candidates answered this question as if it was only about cryptocurrency or blockchains.

(b) Most candidates could identify/describe the date of a transaction as being found in a cryptocurrency's ledger, but few correctly described any additional items of data.

Question 11

Most candidates could correctly describe data mining in the context of banking. However, there was considerable confusion in that many answers went on to refer to advertising and marketing and not to financial institutions. Also, there were a significant number of answers that described the process and stages of data mining and ignored any references to its use. This is an example of candidates not applying their

knowledge to the specific scenario in the question. Answers should have focused on how banking organisations make use of data mining.

As noted for **Question 5**, candidates were expected to write about the use of data mining by banking organisations in a structured way so answers that were given as lists of short statements were not answering the question as set. While Examiners do attempt to give credit for such answers, there is usually little or no 'discussion' or expansion of the statements, so the full mark range is not available to the candidate. 'Discuss' questions require 'discussion' answers if they are to achieve the higher marks.

INFORMATION TECHNOLOGY

Paper 9626/33
Advanced Theory

Key messages

Many candidates demonstrated good subject knowledge in this paper. However, many candidates produced responses with insufficient detail to gain credit or did not properly address the command word in the question. At A Level, candidates are expected to write responses with significantly more detail than single word lists or very brief statements. Centres must ensure that candidates are able to customise their responses according to the command words (shown on p.66 of the current, 2025 – 2027, syllabus) in the questions. Candidates who write answers that do not address the command word do not have access to the full range of marks.

In Paper 3, questions can be set on any, and all, areas of the A Level topic syllabus so centres are reminded to ensure that their candidates study all the content of the subject topics. The syllabus (p.13) also states: 'where the term 'including' or 'for example' is used, everything listed must be studied. 'Including' refers to content which is being considered as part of that topic point. 'For example' illustrates a typical case. The lists are not exhaustive and other relevant and related aspects should also be studied.'

Centres should remind their candidates that the number of marks available for each question is an important indicator of how much detail or how many descriptions should be given in the answers.

General comments

Centres should remind their candidates to read the whole question carefully before attempting to write their answer. The full range of marks is only available to candidates for answers referring to the question scenario. For example, **Question 11** was about the impact of 3D printing on the environment and not about the uses of 3D printing. This is to ensure that they understand exactly what the question is asking and not write answers based solely on 'key' words that they have 'spotted'.

Candidates should be encouraged to write answers in full sentences. Answers with bulleted, short statements for free response questions, especially those requiring analyses, discussions and evaluations do not adequately answer the question. Furthermore, if these answers are shown in a sketched table, they do not properly answer the question as there is no discussion.

Candidates should not repeat the question in their answers. For example, **Question 5(a)** asks for one 'other item of data' but a significant number of candidates included the items given in the question stem in their answer, which did not gain them credit.

This series showed a marked deterioration in the standard of handwriting and presentation of answers. Examiners make every effort to read and interpret a candidate's handwriting but where the writing is illegible marks cannot be awarded. Further, repeated crossing-out, rewriting answers with arrows joining portions of an answer that is spread out into other response areas and over the white spaces of a question paper do not make it easy for Examiners to mark the answers. It was also noticeable that answers that were word processed lacked punctuation, sentence structure and even the simple requirements of numbering the answers to match the question. Centres are requested to remind candidates that answers to questions will only gain marks if they can be read and understood by Examiners.

Comments on specific questions

Question 1

The question described the general purpose of protocols, so this was not given credit in the answers. Candidates were asked to describe the use of the named protocols, both of which are listed in the current syllabus (p. 41).

(a) While some candidates gave good answers, some candidates produced answers that showed that they had little understanding of this protocol, e.g. 'Telnet is television internet'. It is important that candidates study all the protocols listed in the syllabus despite some, e.g. Telnet itself, being superseded by other protocols in more modern communications equipment.

(b) The question asked for the use of L2TP so there was no requirement to describe how or where L2TP operates in the OSI or TCP/IP models.

(c) As for **part (b)**, there was no requirement to describe how or where UDP operates in the OSI or TCP/IP models.

Question 2

Some candidates confused the project life cycle with the system life cycle. Centres should ensure that their candidates have a clear understanding of both.

(a) While most candidates understood that the initiation stage comes first in the cycle, some confused it with the planning stage and described tasks that occur during planning. The question tariff was three marks as shown in the question paper, so a good answer contained a description of any three of the numerous tasks carried out in the initiation of a project. Because the question does not specify the required number of tasks to be described, marks were also available for a valid expansion or a good example of a task.

(b) Explanations usually require reasons to be given. Here, for example, stating the task 'to check that the project has ended' should have been followed by a reason such as 'so that all stakeholders and clients can agree that no further additions or changes are necessary' i.e. a reason is given for the stated task.

Question 3

To gain access to the full range of marks, candidates needed to provide descriptions in some detail rather than a list of statements. For example, 'describes a new system' could be elaborated into the specification describing the features and functions of the new system, specifying the hardware and software required by the new system, or the data that will be used by the new system. The subsequent use of a system specification in e.g. evaluation could also be described. Vague answers or short statements e.g. 'hardware for the software' are not sufficient to gain marks in this type of question.

Question 4

The command word 'justify' requires candidates to make statements on the topic and give reasons or provide a supporting argument for the statements. Most candidates could provide good answers to this question with statements about the features and use of mail merge and why these were reasons to use mail merge for creating the customised emails. Drawbacks of using mail merge were not required when answering this question, nor are they required for any question that uses the command word 'justify'.

Question 5

This question clearly stated information about blockchains and two items of data found within them. Centres are reminded to advise their candidates that marks are not awarded for repeating the details given in the question.

(a) Excluding the items 'records' and 'cryptographic hashes' made this a difficult question for most candidates. It was expected that candidates would answer 'timestamps' to this question, but this was not the case. Very few candidates scored the mark for this question.

(b) Most candidates could give one good answer to this question, but few gained both marks. While marks were not awarded for repetition of the details given in the question, a valid example elaborating or expanding on them was given credit, e.g. securing the details of financial transactions between financial institutions.

Question 6

This question proved difficult for most candidates.

(a) While most candidates could describe the need to ensure that all data is in the same or a suitable format for analysis, few added a second reason, such as ensuring the data was all the same type or making the data compatible with the software used for analysis. The question clearly stated that two reasons should be described so it was not possible to score full marks without giving two descriptions. Centres should ensure that their candidates take note of such demands in the question and of the marks available.

(b) This question did not specify how many descriptions were required. This meant that candidates could gain full credit by either giving four descriptions or expanding on fewer descriptions. Most candidates answer this question well, choosing to make numerous descriptions such as correcting inaccuracies in the data, removing out-dated data, removing duplicate data or ensuring that e.g. names have the same spelling throughout the data.

Question 7

The command word 'evaluate' requires more from candidates than descriptions or explanations. There is a requirement to make judgements on the importance or value of e.g. stated facts, features or functions.

Most candidates could make a statement of fact about compression and give a consequence or effect on a digital image, but few provided a valid judgement or evaluation. Good answers gave a description of how compression was used or of the effects of the compression and then added a consequence followed by a judgment as to the desirability or further effect of the compression. This type of question targets Assessment objective 3 (AO3) and allows candidates to demonstrate their depth of knowledge and how they use it to present reasoned judgements or conclusions.

Question 8

This question required descriptions of both advantages and disadvantages of peer-to-peer electronic money systems compared to cash money for making payments. This meant that candidates who did not give both could not gain full credit. Some candidates confused peer-to-peer with contactless payments or with the use of credit cards. Descriptions of a peer-to-peer system were not required. Most candidates referred to the increased speed of money transfer from sender to recipient, the lack of any need to carry cash money, the difficulty of correcting errors and the requirement of an internet connection. However, many answers were not phrased accurately e.g. 'people can pay directly through devices' so did not gain credit. It is important that answers be precise and have a clear meaning.

Question 9

This question asked only for the drawbacks to banking organisations of using cloud computing so references to benefits or advantages were ignored. It is important that candidates read the question carefully before starting to write answers. There was confusion between cloud *computing* and cloud *storage* with many answers focusing on the latter rather than the broader concept of computing services being provided remotely. Most candidates referred to the security not being directly under the control of the bank, the increased risk of cyber-attacks or having less control over the infra-structure. Good answers provided detail about the drawbacks or provided a comprehensive set of statements about the drawbacks for the six marks.

Question 10

As noted for **Question 4**, the command word 'justify' requires candidates to make statements on the topic in the question and give reasons or provide a supporting argument for those statements. Most candidates could list the features of a VPN, but few used these to justify its use. To achieve the maximum six marks for this question, answers should have referred to the features or functions of a VPN and then explained why these justify its use, e.g. VPNs can use encryption which provides the security of data and increases the privacy of the senders.

Question 11

This question allowed candidates to demonstrate their knowledge of the impact of a 'new and emerging technology', in this case 3D printing, on the environment. At A level, candidates are expected to have a detailed understanding of how technologies affect the environment and to be able to express this precisely in their answers.

(a) Many answers were vague and imprecise e.g. 'reduces global warming or climate change' or 'cost effective', with little or no reference to 3D printing.

(b) Most answers did not explain the negative effects of 3D printing on the environment in sufficient detail e.g. 'uses plastics' was not often followed by the environmental impact.

INFORMATION TECHNOLOGY

Paper 9626/04
Advanced Practical

Key messages

The areas where most candidates found it difficult to achieve the higher-level marks were the creation of the database and the completion of the mail merge document.

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

- Ensure learners understand Third Normal Form and the use of linking tables to enable flexible, accurate data relationships.
- Provide practice in building efficient queries, particularly for dynamic subform filtering and calculated field outputs.
- Develop learners' competence in Form Design and Configuration, for example adjusting properties, applying consistent formatting standards, and designing user-friendly interfaces.
- Highlight the comparative strengths of run-time versus stored field calculations, especially in relation to data accuracy and validity.
- Reinforce the use of built-in filtering features in mail merge tools to efficiently meet defined selection criteria.
- Guide learners in replacing template placeholders with correctly formatted merge fields to achieve professional document output.
- Offer targeted training on structuring linear or nested conditions within mail merge documents using conditional logic hierarchy to control inclusive and exclusive text responses.
- Promote attention to document formatting standards, including the precision of layouts and the quality of presentation, in alignment with rubric and professional expectations.
- Incorporate tasks that challenge learners to analyse tasks for data requirements, presentation needs, and determine probable criteria.
- Enable learners to interpret specification expectations and use provided criteria to critically evaluate their own work.
- Provide practice in the problem-solving elements of tasks.

General comments

Most candidates attempted all the tasks but only a few seemed very well prepared for this session.

Full solutions to the data analysis and visualisation task were rare.

Many candidates did not match all the details shown in the question paper.

Comments on specific questions

Task 1

The first part of the task involved analysing the data provided to determine the tables and fields required for importing into the database. This proved to be straightforward, and most candidates also chose correct fields as primary keys or added an auto numbered field for the import. Either method was suitable.

With only Buyers, Cars, and Trader tables it was possible to set valid relationships and achieve 3rd Normal Form, but stronger candidates realised that without the link 'Sales' table, only one record for each Trader or Buyer would be valid. For example, without a linking Sales table, each buyer could only record a purchase of a single car.

Most candidates were successful in creating the basic form and formatting it correctly, but many found inserting the subforms displaying the information about the cars sold and unsold more difficult.

The most efficient method was to base the data in the subforms on two queries with criteria that determined whether the cars for a trader had been sold or were unsold.

For the cars that had been sold, an auction fee needed to be calculated. This calculation was most efficiently carried out at run-time in the cars sold query, but some candidates included it as a field in the Cars table. Unsold cars would therefore show a fee of zero. For this session, either solution was acceptable, and most calculations seen were well thought out and matched the inequalities required.

Many candidates were not able to correctly format the subforms to match the examples. Candidates were required to ensure that the correct fields were fully visible and that no scroll or navigation bars were seen. In addition, the option to add data needed to be turned off.

Candidates would benefit from gaining experience of configuring the properties of elements in form design.

All candidates managed to create a report, but the data should have been based on a query and only display the required details for the cars that were recorded as sold. Many candidates included all the records in the cars table.

When present, the calculated fields for the total values of the sales and the fees were done well and most candidates matched the formatting shown in the question paper.

Whilst the header was often formatted accurately, the data for each trader was supposed to be displayed on its own page with the header visible on each. Very few candidates managed to achieve this. Candidates would benefit from practice in setting page breaks etc.

Task 2

This task required candidates to determine which mergefields were needed and to filter the data.

Only cars sold on Monday should have been selected and the data for the Auto Emporium trader should have been excluded.

Many candidates returned to the spreadsheet for the data. This was inefficient and very few accurate results were seen from those using this method.

The template showed the layout of the required merge document and had <*placeholders*> for the merge fields.

Some candidates inserted the merge fields inside the placeholder symbols. The resulting documents were therefore not of a professional standard as specified in the question paper rubric.

The logic of the conditional fields to display the correct text for the three options was understood by many candidates, but very few completely correct solutions were seen. The main issue was the hierarchy of the conditions and many solutions resulted in two of the text options being displayed.

In general, this was a problem-solving task with requirements to determine, select and refine the data required and configure a hierarchy of conditional inclusions. Most candidates found the problem-solving aspect difficult. Only a handful of solutions for the correct recipients were seen and none of the documents were formatted without some flaws.

Task 3

All candidates made a reasonable attempt at this task. The main issues that differentiated the resulting solutions were whether the movements of the elements were timed accurately and animated smoothly.

Many candidates had difficulty animating the chequered barrier carefully. The barrier had to be duplicated and combined so it always filled the frame as it was moved horizontally by 5 squares every second. This was to give the impression of movement to the static red car. It was important to combine the images of the barrier, so the animation looped seamlessly.

When animating the green car, all candidates recognised that using layers ensured that the green car appeared to pass in front of the red car. A single tween was needed to generate the frames for the car to take 6 seconds to appear from out of frame on the left and move smoothly to off frame on the right. However, many attempts were flawed in that the green car seemed to change speed during the path, indicating that more than one tween was used. Other issues noted were that the green car was not always completely out of frame at the start and did not always only travel horizontally.

Overall, it is clear that most candidates had sufficient proficiency for this task.