INFORMATION TECHNOLOGY

Paper 9626/11
Theory

Key messages

In the main, candidates appeared to have been better prepared for this assessment compared with last year.

Many candidates showed a greater level of understanding although there were still areas of the syllabus where many candidates appear to lack detailed knowledge.

On much of the paper some expansion and detail is required. It is not sufficient to give brief answers.

Evaluation requires the candidate to discuss the importance, weigh up the advantages and disadvantages, judge the overall effectiveness and weigh up their opinions, of a number of options. It is important that comparisons are made rather than just giving features or uses.

Discuss questions require candidates to give the important arguments for and against and often requires a conclusion. This cannot be achieved by simply writing bullet points. These are not regarded as providing the basis for a discussion. In future assessments it is likely that the absence of a coherent discussion, involving arguments for and against, will attract very low marks.

Compare and contrast questions require candidates to provide similarities as well as differences. Many candidates often did not seem to appreciate the need to state similarities and concentrated solely on differences.

Questions which required a recall response were handled well by most candidates particularly questions which required short answers, though there are few on this paper. Candidates appear to struggle to give accurate and detailed responses to questions in which they are required to apply their knowledge and understanding.

This paper involves a lot of handwriting from the candidates. In order to help the Examiner clearly see and understand what the candidate has written it is very important that the handwriting is not rushed and can be easily read. Rushed scripts and poor handwriting can make it very difficult for an Examiner to understand what the candidate has written down. This can lead to the candidate not being awarded a mark.

Questions which require higher order thinking skills and the ability to evaluate resulted in better responses this session, though there were still some weak answers. Teachers would be well advised to further develop the skills of their learners beyond recalling points of information to enable them to gain better results at this examination level.

It is important that candidates are discouraged from learning past mark schemes by rote. This was evident in candidates' answers to **Question 3** where candidates did not answer the question that was set.

General comments

For the tick box questions, some candidates are not putting down the required number of ticks. Candidates need to be encouraged to answer all the questions as fully as they can.

In general, the candidates' use of technical terms in answering the questions is not as good as it should be after studying this subject for one year. Many answers to the questions were too vague or just not detailed enough to gain the marks.

At times, it appeared that candidates rushed into giving their answers whereas they would have been better advised to list their thoughts in rough before choosing, and elaborating on, items from their list that would be appropriate to their response to the question.

A large number of candidates are still using trade names for software. There appeared to be a lack of knowledge of technical terms for candidates taking an examination at this level. Handwriting was sometimes almost illegible, making scripts very difficult to mark.

Comments on specific questions

Question 1

Candidates did fairly well on this question with many candidates gaining at least three marks. There appeared to be little pattern to the incorrect answers, although a sizeable number of candidates thought that peer-to-peer networks always require an employee to manage the network and many thought that in a client-server network each client functions both as a client and as a server simultaneously.

Question 2

Candidates performed about the same on this question as they did on **Question 1**. Among a number of candidates, there were errors. It can only be assumed that candidates do not have great experience of the different types of user interface when the most popular incorrect answers were 'The colours used in a dialogue interface are of key importance', 'A mouse is an essential input device when using a command line interface.' and 'The font size is the most important feature of a command line interface.'

Question 3

This question revealed some knowledge of the topic but, unfortunately, many candidates had not read the question properly and just compared the three devices giving the benefits and drawbacks. Not many candidates appeared to understand how data is stored and what the purpose of each of the three devices is. The majority of candidates struggled to make even one good point. Incorrect answers included needles reading the surface of a disk and lasers making holes in discs. Magnetic tapes were poorly understood with some candidates confusing them with the magnetic stripe on the back of a credit card.

Question 4

A number of candidates seemed to be very familiar with the topic and had prepared well. Most candidates made at least three good points showing a good understanding of the meaning of the digital divide, though some candidates had trouble expressing the answers well enough to score maximum marks. Candidates did not always address both parts of the answer, only presenting the problems and not the solution.

Question 5

Although some candidates showed a little understanding of the topic, many did not give adequate drawbacks. Many neglected to address the simulation part of the question. Most seemed unable to elaborate on the usual drawbacks of expense, errors and timescale with the equivalent of one-word answers being supplied by the candidates. Many of the answers were trivial and unjustified. The topic of simulation needs to be studied in greater depth.

Question 6

Candidates often attempted to relate their answers to the scenario but many, again, appeared to resort to one-word answers. Most performed better on part **(a)** than they did on part **(b)**.

(a)   Generally, where candidates made valid points it was down to recognising that the papers would get marked more quickly and more accurately than manual methods. It was disappointing to see candidates just writing 'it's quick' or 'it's accurate' without making the comparison or saying in what regard.

(b)   Candidates found it more difficult to provide disadvantages of using an OMR system. Many said it would make mistakes but did not elaborate as to how. Others said that it would be difficult to read

the correct answer without expanding on this. A number of candidates did not appear to understand that OMR is about reading marks not characters.

Question 7

A number of candidates were able to score highly on this question providing good answers and showing an understanding of safety when using IT. However, despite e-safety being excluded by the question, many candidates gave answers relating to this. Safety concerns were mixed up with health concerns by a large number of other candidates. For those that answered correctly with safety related answers there was sometimes a misunderstanding as to why, for example, drinking and eating should not be allowed near computers or why sockets should not be overloaded.

Question 8

This question produced some reasonable answers, however candidates frequently did not make more than one point for each section. Candidates should realise that where six marks are available six distinct points need to be made. The answers were often on the right lines but written without the necessary attention to detail.

Question 9

This question was generally well answered. Parts **(a)** and **(c)**, however, tended to produce better answers than parts **(b)** and **(d)**

(a) Generally, this was quite well answered with most candidates gaining at least three marks. A common error was to omit the –500 after C4 and often to omit the "" as well. A number of candidates used the 'x' symbol instead of '*'.

(b) Most candidates found this difficult to answer with many using SUMIF instead of SUMIFS. Many struggled to include all the arguments, often leaving out at least one range. A number of candidates attempted to use a nested IF statement with no success. Some ignored the requirement of a conditional formula and just wrote down an expression requiring the addition of the cells containing the relevant values which gained no credit.

(c) Generally, this was fairly well answered with most candidates appropriately using the COUNTIF function although sometimes struggling to define the cell references to match the required answer.

(d) It was disappointing to see candidates concentrating heavily on one aspect of the question, either the setting of the column widths or the setting of the currency but rarely both. Despite similar types of question appearing in previous papers, requiring candidates to write instructions which could be followed by a user of the system, candidates are still describing what might have been done to solve the problem instead. Despite the exact numbers being given to the column widths in the question these were largely ignored in the answers.

Question 10

This question was fairly well answered with the majority of candidates making reasonable attempts to produce a solution. Most candidates did well on many parts but **a(iii)** seemed to provide the most difficulty.

(a) Candidates did quite well on part **(i)** with a number of correct answers being produced. Most understood the need for Reg_No = but many struggled to get the "L*" part. For part **(ii)** a number of simple errors led to maximum marks being scored by only a few candidates. Common errors were leaving out the AND command or the speech marks around "Frod" and "Blue". Occasionally Frod was carelessly written as Ford. Part **iii** was problematic with a number of candidates gaining a mark for the Model = "Eagle" part but then found difficulty in deducing the correct expression for the Colour part.

(b) Most candidates showed a fair understanding of the sorting process with the majority of candidates managing to correctly identify the first sort but unfortunately most were unable to see the need for the second.

(c)   It was pleasing to see how many candidates understood the concept of a primary key. Generally, this question was well answered with most candidates able to identify the correct key field although fewer were able to expand on the reason why it was chosen.

Question 11

The concept of normalisation is a difficult one so it was not surprising to see candidates struggling to come to grips with this question. Many candidates seemed to have a basic grasp of the concept but not have sufficient understanding to enter into a discussion about the topic. Even the most able candidates were unable to gain more than half marks.

Question 12

This question produced better answers. It was unfortunate that, given the information in the stem, many candidates chose to concentrate on one method only. Although they produced good answers for that particular aspect, this limited their opportunity to gain more than level one marks. In the higher difficulty questions such as evaluate, it is important that candidates respond to all aspects of the question.

INFORMATION TECHNOLOGY

> **Paper 9626/12**
> **Theory**

Key messages

Overall, candidates appeared to have been better prepared for this assessment compared with last year.

Candidates showed a greater level of understanding although there were still areas of the syllabus where many candidates appear to lack detailed knowledge.

On much of the paper some expansion and detail is required. It is not sufficient to give brief answers.

Evaluation requires the candidate to discuss the importance, weigh up the advantages and disadvantages, judge the overall effectiveness and weigh up their opinions, of a number of options. It is important that comparisons are made rather than just giving features or uses.

Discuss questions require candidates to give the important arguments for and against and often requires a conclusion. This cannot be achieved by simply writing bullet points. These are not regarded as providing the basis for a discussion. In future assessments it is likely that the absence of a coherent discussion, involving arguments for and against, will attract very low marks.

Compare and contrast questions require candidates to provide similarities as well as differences. Many candidates often did not seem to appreciate the need to state similarities and concentrated solely on differences.

Questions which required a recall response were handled well by most candidates particularly questions which required short answers. Candidates appear to struggle to give accurate and detailed responses to questions in which they are required to apply their knowledge and understanding.

This paper involves a lot of handwriting from the candidates. In order to help the Examiner clearly see and understand what the candidate has written it is very important that the handwriting is not rushed and can be easily read. Rushed scripts and poor handwriting can make it very difficult for an Examiner to understand what the candidate has written down, which can lead to the candidate not being awarded a mark.

Questions which require higher order thinking skills and the ability to evaluate resulted in better responses this session though there were still some weak answers. Teachers would be well advised to further develop the skills of their learners beyond recalling points of information to enable them to gain better results at this examination level.

General comments

For the tick box questions, some candidates are not putting down the required number of ticks. Candidates need to be encouraged to answer all the questions as fully as they can.

In general, the candidate's use of technical terms in answering the questions is not as good as it should be after studying this subject for one year. Too many answers to the questions were too vague or just not detailed enough to gain the marks.

At times, it appeared that candidates rushed into giving their answers whereas they would have been better advised to list their thoughts in rough before choosing, and elaborating on, items from their list that would be appropriate to their response to the question.

A large number of candidates are still using trade names for software. There appeared to be a lack of knowledge of technical terms for candidates taking an examination at this level. Handwriting was sometimes almost illegible, making scripts very difficult to mark.

Comments on specific questions

Question 1

As with **Question 2**, candidates were asked to provide four ticks for the most accurate statements. Therefore, it is expected that only four ticks would appear in each question. There was a range of ticks and crosses provided for each question, and in some instances more than the required number of ticks were also evident. However, candidates did fairly well on this question with many candidates gaining at least three marks. A large number of candidates incorrectly ticked the top box, indicating that they thought verification is checking that data is correct. A number of candidates confused verification and validation. Occasionally candidates ticked fewer than the four answers requested and missed the opportunity to gain marks.

Question 2

Candidates did slightly better on this question with many gaining at least three marks and higher ability candidates gaining four marks. Among a number of candidates, the common errors were choosing 'A pen drive is an input device' and 'Inputs must be converted to analogue data before they can be processed by a computer' as accurate statements. Again, a small minority of candidates ticked fewer than the four answers requested and missed the opportunity to gain marks.

Question 3

This question was reasonably well answered with the majority of candidates making at least three good points. Answers relating to worms and trojan horses were generally good although answers relating to features of adware needed embellishing. Some weaker candidates seemed to have failed to read the question thoroughly and missed the key word 'distinctive' and gave answers for each type of malware which were very similar.

Question 4

A number of candidates seemed to be very familiar with the topic and had prepared well. Overall, however, this question was not answered as well as had been expected. Part **(a)** produced many better answers than part **(b)**. Where candidates did not answer this question well it was usually because they failed to elaborate on the point they were making such as 'it is easier because…'

(a)   Most candidates described one advantage well with the more able often describing at least two. Most candidates gained at least one mark for this question. The most common correct answer related to the fact that HTML code was difficult to remember. A number of candidates gave answers based on HTML can take longer but failed to describe that this related to writing the code.

(b)   The most popular answers where candidates scored marks related to it being 'expensive to buy' and that it provided limited user options. However, candidates generally did not do as well on this part of the question. Many aspects of the question seemed to be overlooked by the candidates.

Question 5

Candidates did fairly well on this question with many gaining at least half marks. Many candidates failed to appreciate that in order to gain full marks they would need to provide similarities as well as differences and in addition would need to provide correct examples. It was disappointing to see that a minority of candidates provided examples of incorrect formulae. Most candidates failed to provide similarities and so were limited to a maximum of three marks.

Question 6

Most candidates managed to describe at least one benefit but even the more able often failed to provide more than two. The most common correct answers related to good explanations of why simulations are less dangerous and the reduction in costs. However, a number of candidates seemed to concentrate on what a model does rather than its benefits. Many wrote about models describing what they were capable of and how

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to create one or the components of a model but failed to mention benefits. Incomplete answers included "Making a model is cheaper than making the real model". Candidates should realise that comparative words such as cheaper, quicker, safer and so on should always be amplified and justified. They are also comparative terms and so should be compared with something; i.e. cheaper than what?

Question 7

It was pleasing to see some candidates were able to describe the difference between ADSL and SDSL, in terms of bandwidth and bit rate up and downstream. However, many candidates attempted to define the words, with only a few being successful. However, very few were able to describe ISDN in detail. The descriptions for ISDN were the least successfully answered of the 3 technologies.

(a) Most candidates seemed to lack knowledge of this technology. In many instances candidates simply did not respond to the question. Where answers were provided, many candidates did not accurately expand on the abbreviation for ADSL. Where candidates had made a good point about greater down load speeds than upload speeds, however, the implication of download/upload speeds was not expanded upon.

(b) In many instances candidates simply did not respond to the question. Where answers were provided, many candidates did not accurately expand on the abbreviation for ADSL. Where candidates gained a mark it was generally related to SDSL having equal upload and download speeds but, again, the implication of download/upload speeds was not addressed.

(c) This was not as well answered as the other parts with many candidates appearing to lack any detailed knowledge of this technology.

Question 8

Many candidates provided good answers for this question. Candidates seemed to gain an equal proportion of marks for parts **(a)** and **(b)**.

(a) Generally, this was quite well answered with most candidates able to define at least two validation checks which would be needed. However, a number of candidates confused verification and validation describing 'visual checks' and 'double data entry', with some referring to 'spell checks' and the use of a 'lookup'. In other instances, candidates did not include cell references where the specific validation needed to be carried out. Some appeared to be confused over the name of the check and gave a completely different description. Check digits appeared to be the least well understood.

(b) Most candidates were able to correctly write down part of the formula = LEFT(A2, 3) or variations of that. Few candidates were able to successfully convert this into a number. The question then asked candidates to describe how the Price was formatted so that is appears as it does in the spreadsheet. Many candidates failed to describe it so that someone could actually follow their instructions to achieve what the questions was asking for. Candidates need to ensure that they read the question fully before they answer it.

Question 9

Candidates seemed to be well prepared for this topic with some good answers provided. However, a number of candidates had not read the question carefully and gave one-word answers rather than describing each component. The meaning of a data dictionary was normally well understood, but components of the dictionary were sometimes listed without expansion and often field format and field data type were confused.

Question 10

This question was fairly well answered with the majority of candidates gaining at least eight marks. Most candidates dis better on part **(a)** than part **(b)**.

(a) Most candidates were able to gain at least four or five marks for this question. Typical errors were not identifying the Showroom ID field in the Cars or the Showrooms tables with many candidates writing it as Showroom. In the Agents Table most candidates were able to identify Agent ID and Agent email but failed to split the name into first and second name fields. Candidates also struggled to split the showroom data in order to identify the fields needed in the Showrooms table.

(b)   This question was generally not as well answered as part **(a)** though many still managed to gain at least three marks. Most the candidates identified the Agent ID as a primary key and Car ID as a primary key and the linking of Agent ID in the Agents table to Agent ID in the Cars table. Many candidates did not indicate any foreign keys and were unable to correctly indicate the one to many nature of the relationships.

Question 11

It was gratifying to see a good understanding of RAM and ROM shown by the majority of candidates. Unfortunately, a significant number of candidates did confuse ROM and RAM. Some thought that ROM referred to CDs or DVDs. The majority of candidates seemed to lack detailed knowledge of hard disks in the scheme of things and their mode of operation was poorly understood.

Common answers were based around date in RAM being lost when power is off and date in ROM being kept when power if off. Quite a few candidates were able to describe that RAM stores data for the short term and HDD drives stores data permanently. Few identified that HDD can be portable as well as fixed. Also, in a lot of cases their evidence was not presented in a structured and coherent format.

Question 12

Generally, well answered with most candidates being able to gain marks. This seemed to be a topic for which the candidates were well prepared. Most candidates were able to gain some marks for their discussion. Although it made little difference on this occasion, candidates are expected to answer the question as set. Many ignored this and provided advantages and disadvantages of a client-server. The main points seen in the answers were based around backups, the expense to setup and maintain a client-server network when compared to a peer to peer network, and the resilience of a peer to peer network when compared to a server failure in a client-server network.

INFORMATION TECHNOLOGY

> **Paper 9626/13**
> **Theory**

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INFORMATION TECHNOLOGY

> **Paper 9626/02**
> **Practical**

Key messages

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

*   Candidates need a better understanding of the types of relationship that occur between tables in a relational database.
*   Candidates need to be more familiar with applying their theoretical knowledge to practical tasks including:
    *   creating a relational database normalised to 3NF
    *   considering **appropriate** data structures (including table names and field names)
    *   considering the target audience when creating software solutions
*   Candidates need to ensure that if they submit more than one copy of an answer (particularly for the database queries and reports) it is clear to the examiner which version is the correct one. As these are frequently stored within the software it is not possible to identify which version the candidate deemed their finished version.
*   Candidates need more practice and experience in setting the timing on video creation.
*   Candidates need to have access to and be familiar with video conversion software if the centre's chosen package does not support exporting to common file types.
*   Candidates need to take greater care with the accuracy of data entry.

General comments

A significant number of candidates omitted one or more of the required files to be submitted for assessment, or submitted the files in the wrong file format, (for example: video files were frequently submitted as .wlmp project or .wmv files rather than exported into .mov and .mp4 format).

Comments on specific questions

Question 1

Few candidates followed the instruction to examine the data in the files, resulting in errors in **Question** 4. Most candidates successfully created a relational database using four tables. Few candidates created this to 3NF with a fifth table to ensure that there was not duplication of data in any of the tables. Table names were frequently the names of the four supplied csv files which included the prefix N18 (for November 2018). This was not appropriate to be included in the name of the data tables. Field names were frequently created using the data given in row 1 of each csv file without any consideration of the requirement of 'short, meaningful, consistent in style and contain no spaces'. The selection of primary key fields was frequently left to the import wizard within the database and in some cases no key fields were created ensuing that the candidate could not create appropriate relationships between the tables. Despite being instructed to save the database, a significant number of candidates did not submit their database for assessment, although it was clear that they had created one from their Evidence Document. A small number of candidates submitted a shortcut to their database which will not open on any other machine so could gain no marks.

Question 2

This question was attempted by most candidates with varying degrees of success. The selection of the correct four flights was frequently correct, although some candidates did not check whether the data they had extracted met the criteria given in the question. Almost all candidates found the flights to Jakarta (some returned the dates of flights from Jakarta) but fewer candidates used the correct criteria to select the dates. A number of candidates attempted to use dynamic queries which did not show their ability to enter the correct parameters and attain the correct search results.

Question 3

This step was completed well by many candidates, but some did not consider the suitability of the report for a user, for example: ensuring that text was large enough to be easily read and field names were consistently presented using consistent case, not truncated and fitting within a single page with an appropriate report title.

Question 4

Not all candidates successfully completed this question. There were a number of methods used with differing degrees of success. Some successful candidates created a query including a calculated field to show the duration of each flight before creating their report. Few candidates had examined the data carefully in **Question 1** so did not consider that some flights were overnight and departed the day before they arrived. Hence few candidates calculated the duration with accuracy for all destinations. Some candidates did not use the most efficient methods for this question, exporting and calculating data in a spreadsheet, before re-importing the data and presenting it in their database. This method would not allow the report to be regenerated easily if new data was added or the data was edited and did not evidence their ability to use arithmetic operations, numeric and logical functions to perform calculations within a database. Several candidates did not include their candidate details formatted consistently with the title.

Question 5

This step was completed well by a number of candidates, but many did not consider the suitability of the report for a user, for example: ensuring that the text was large enough to be easily read, not truncated and fitting within a single page with an appropriate report title.

Question 6

This question was completed with a variety of responses, most candidates who attempted it used a crosstab query with COUNT as the function. Fewer candidates formatted the report into a single portrait page with the gridlines showing. Very few candidates included gridlines with the report from their crosstab query, many who attempted this erroneously substituted the required gridlines with boxes. Some of the candidates who otherwise completed this successfully did not include the final column (for crew AC8) from their query in the report and subsequent pdf file.

Question 7

Many candidates described the pie chart rather than evaluating it. Most candidates identified that too many colours were similar and it was not possible to identify each employee's data. Fewer candidates commented on the lack of values or considered the suitability of the title for this data. Many candidates commented that a better solution would be to use a bar or column chart, but did not explain that this shows actual values whereas a pie chart only shows the proportions or percentages of the whole total.

Question 8

This question caused a problem for most candidates. Although many had displayed the required skills for one-to-many and many-to-many relationships in **Question 1**, few demonstrated the understanding of each relationship type. The most common misconception was that a one-to-many relationship was where 'one field was related to many fields'. Many candidates interchanged the terms fields, records, rows and tables in a variety of interesting ways, none of which elicited a correct answer.

Question 9

Most candidates who attempted the video (and provided evidence in a correct file format) completed this correctly. A small number of candidates erroneously changed the running speed of the clip so that it lasted 7 seconds rather than trimming it.

Question 10

This question was completed as instructed by most candidates.

Question 11

Whilst most candidates completed this as instructed, a significant number ignored the instruction that the title text should have no animation.

Question 12

Few candidates extracted the final frame, leaving their completed video with a very 'jerky' section near the end. Most candidates did set this as a background for the credits but few candidates ensured that their credits were appropriate with good contrast to all of the background, especially if scrolling credits were used. Some candidates produced excellent credits with additional information added to ensure a professional end to the video. Most candidates saved their video in .mp4 format with the correct filename.

Question 13

Very few candidates had exported their finished video into .mov format with the correct filename.

Question 14

Most candidates saved their Evidence Document.

INFORMATION TECHNOLOGY

> **Paper 9626/32**
> **Advanced Theory**

Key messages

Centres are reminded to ensure that candidates read the questions carefully and apply their knowledge to the question or scenario. Candidates will gain access to the full range of available marks if their answers are in the context of the question. However, looking for, or 'spotting', 'key words' in the question and then writing answers based on those keywords will score few, if any, marks.

It is essential that candidates read the short scenarios and the information therein very carefully and apply their knowledge when answering the subsequent questions. As stated above, many candidates did not apply their knowledge to the given scenarios or to the context set in the questions. Generic answers do not score the higher marks because knowledge is not appropriately applied and the responses do not answer the question.

Some candidates appeared to have good subject knowledge and some good technical descriptions were seen. However, many seemed to lack knowledge of the specific syllabus topics in order to answer the questions. It is important that all topics in the current syllabus are studied.

General comments

The syllabus shows a list of 'command words' that appear in the questions. When answering questions, candidates must read the rubric and answer the question in the appropriate manner according to the command word used. Ignoring the command words used and creating numbered bullet points or dashed lists for questions that require free responses will score very few marks. As has been noted in previous reports, the use of bullet points rarely produces little more than simple points or short statements with no explanations or descriptions. These do not 'explain', 'describe', 'discuss' or 'evaluate' a topic and rarely score the marks. Candidates who pay attention to the command words in the question and write in sentences and paragraphs produce responses that score more marks.

Comments on specific questions

Question 1

(a)   This question required candidates to describe how credit card holders could be subjected to credit card fraud when using their credit cards for online purchases. Good answers described the various ways that credit cards or credit card details could be obtained and used in fraudulent ways e.g. the use of spyware or keylogger software to capture any credit card numbers as they are typed by the user, the use of 'customer not present' transactions using security numbers obtained by theft or phishing or by unscrupulous merchants or by repeat billing charges to a credit card account where an uncancelled 'membership' is charged monthly. Answers that described how credit card fraud cold be prevented e.g. using only secure websites for online purchases did not answer the question and so did not score marks. This question is an example of where spotting a set of key words such as 'credit card' and 'fraud' could lead to a question being misinterpreted. Candidates must be encouraged to read the question carefully.

(b)   This question was about the actions that merchants could take to combat credit card fraud. Responses that described how credit card fraud could be carried out by merchants did not answer the question as candidates were required to describe examples of e.g. a merchant demanding some extra security information such as a card security code, checking that the address given for delivery matches the credit card billing address or by using third-party services to take payment

from the card account and pass it on to the merchant. Other actions such as not displaying the full card details on receipts or in email confirmations and the security of encryption when storing credit card details should have been included in good answers.

Question 2

While this question was about bitmap and vector graphics, the emphasis was on the use of the graphics. Most candidates could identify the types of graphics. Poorer answers did not apply the differences to the context and did not fully answer the question. Good answers explained the differences in the two types of graphics in the context of their use in scalable titles for a slideshow. Good answers should have included the fact that vector graphics (Fig. 2) are created by instructions or code so when zoomed the graphic is recalculated with no loss of quality. Fig. 1 cannot be zoomed without loss of quality or clarity because it is (a bitmap image) made of square pixels which become visible when the image is zoomed making it unreadable.

Question 3

Questions about the use of robots in industry usually produce good answers from candidates, most of whom are knowledgeable about their use. However, to score good marks on this question, candidates had to evaluate the impact of the use of robots on the environment. Impacts such as the more accurate spraying of crops by robots reduces overspray and use of chemicals on crops, robots used in food packaging to try and reduce the contamination of the food product because there is no human contact and the increased use of power over manual labour producing more harmful emissions along with the environmental damage caused by the extraction of precious and rare metals for robot production should have been included in good answers. Poorer answers mentioned only a few impacts or were about the benefits and drawbacks of using robots in industry and did not answer the question.

Question 4

(a)   This question was about packet switching and the transfer of packets through networks. Poor answers simply listed a sequence of routers through which the packets could travel e.g. B to C to E etc. with no details of how or why they would follow this route. Answers that lack detail do not score marks. Good answers should have explained that each packet has its source and destination addresses stored in a header and each router has a stored lookup table of IP addresses/and routes to the destination. Answers could have been inproved by detailed explanations including if the route to the destinaton is not known the router sends the packet to another router. and that each packet can take a different route from other packets.

(b)   More detals about the role of routers in the movement of packets were required by this question. Some good answers that incuded details such as router D may be in heavy demand or not responding or a policy may exist in router C to override the routing tables so that the packets are not sent to router D. Good answers included technical details.

Question 5

(a)   This question was about how white box testing could be applied to the testing of some JavaScript code. Candidates were expected to be able to know the details of white box testing and apply their knowledge when explaining how the code could be tested. Good answers should have included the testing of every line and the testing of every branch or condition. Also, details of the testing of the arithmetic and logical operations included in the code would have gained marks. Vague responses mentioning normal, abnormal or extreme data out of context did not gain marks. There was some confusion between white and black box testing so centres are encouraged to ensure that candidates know the difference.

(b)   Placing JavaScript code in external files that are called upon as when required is considered good practice. Candiates are expected to know the techniques used when scripting in JavaScript. Good answers included e.g. the separation of HTML and JavaScript code to provide modularity and separation into different conceptual and functional areas for ease of development and testing as well as ease of maintenance. Reuse of code by different pages and the reduction in loading times of pages also featured in good answers. Poorer answers referring to hacking and stealing of code did not score marks.

Question 6

There were some quite good answers referring to the use of polarised light for encoding and the subsequent decoding data and the use to establish a shared key between sender and recipients. However, many vague references to the use of 'physics' for encryption rather than 'electronic' methods were seen. Such answers convey no understdding of the mechanisms involved and are very superficial in content. At this level, candidates are expected to be able to respond in more technical language.

Question 7

This question produced some good, detailed answers in the context of the clothing store. Good answers quoted the details of the stock being sold and the updating of the database and the consequences of the sales. Candidates showed good understanding of the automatic processes that could maintain stock levels in the store and included reference to scanning barcodes which contain the item code for walking boots (XYP234) which is then used to look up the items in the database, the matching record is found in the database and as two pairs of boots were sold so the value in the field holding the number of boots in stock is reduced from 16 to 14. Given that the new value is less than the quoted (in the table) re-order level (15), an order for 10 pairs of boots is generated to request an order be placed for a further 10 pairs. As the table gave considerable detail about the stock, good answers should have included the details. There were, however, some instances of poor, superficial answers that showed that the candidates did not really understand how automatic stock control works or did not refer to the data given in the question.

Question 8

This question required candidates to detail the advantages and disadvantages of the use of infra-red as a method of transmitting data and then to comment upon them and to reach a conclusion about the suitability of the method. Good answers wold have explained that infra-red is suitable for use where there is no physical connection medium but allows commnciation only over short distances and may not work relaibly when sender and receiver are too close together, line of sight is required so objects block the signals, but it is not subject to interference as much as are other radio technologies. Some candidates produced some good answers and scored well on this question but few conculsions were seen.

Question 9

Throw away prototyping appeared not to be understood by most candiates beyond the fact that the prototypes are discarded.

(a)   A few candiates mentioned that throw away prototyping can be the quickest method of obtaining user feedback but most merely stated what it was. Good answers should have referred to the use of the method.

(b)   Drawbacks such as the time and cost of the protoype being wasted were common good answers. Few candidates described more than one drawback, despite the requirement being clearly stated in the question, and centres are reminded to ensure that their candidates read the question carefully to determine its requrements.

Question 10

Most candidates could describe pilot running and how it is used. However, the question required that candidates look at its suitability for use in a specific scenario. Generic answers about time and cost and (no) loss of data when the pilot running method of implemtation is used did not score many marks. Good answers should have referred to how the method could be used to install Wi-Fi in one hotel before it is installed in others and, be referring to the benefits and drawbacks, expain why the method is suitable – or not suitable – for this scenario. Poorer answers simply described how the method is carried out.

Question 11

Most candidates could describe how observation is carried out. The question, however, required that the effectiveness of observation as a research technique be considered. Good answers referred to the obtaining of valid data because observation is primary research and the observer can check the accuracy of the data themselves, but observation is not effective for events that may take place when an observer is not present or is not looking, for events that cannot be observed or where the observer does not have the technical knowledge of what they are observing. Poor answers gave descriptions of how observations are carried and may upset the observed but did not comment upon how this impacted upon the effectiveness of the technique.

INFORMATION TECHNOLOGY

Paper 9626/33
Advanced Theory

Key messages

Centres are reminded to ensure that candidates read the questions carefully and apply their knowledge to the question or scenario. Answers in the context of the question will allow candidates to gain access to the full range of available marks. However, looking for, or 'spotting', 'key words' in the question and then writing answers based on those keywords will score few, if any, marks.

It is essential that candidates read the short scenarios and the information therein very carefully and apply their knowledge when answering the subsequent questions. As stated above, many candidates did not apply their knowledge to the given scenarios or to the context set in the questions. Generic answers do not score the higher marks because knowledge is not appropriately applied and the responses do not answer the question.

Some candidates appeared to have good subject knowledge and some good technical descriptions were seen. However, many seemed to lack knowledge of the specific syllabus topics in order to answer the questions in sufficient depth. It is important that all topics in the current syllabus are studied.

General comments

Candidates must read the rubric and answer the question in the appropriate manner according to the command word used. The syllabus shows a list of 'command words' that appear in the questions and explains what each word requires from candidates. Ignoring the command words used and creating numbered bullet points or dashed lists for questions that require free responses will score very few marks. As has been noted in previous reports, the use of bullet points rarely produces little more than simple points or short statements with no explanations or descriptions. These statements do not 'explain', 'describe', 'discuss' or 'evaluate' a topic and rarely score the marks. Candidates who pay attention to the command words in the question and write in sentences and paragraphs produce responses that score more marks.

Candidates should also answer the questions in some detail. Many answers are superficial and vague and do not gain credit. At A Level, candidates are expected to be able to formulate answers that properly convey their knowledge and understanding.

It was good to note that fewer candidates omitted questions. Candidates should always be encouraged to attempt all of the questions.

Comments on specific questions

Question 1

(a) This question required candidates to examine the images provided and to describe how software tools could be used to change one image into the other. Most candidates scored all the marks for this question by referring to e.g. the use of the crop tool to remove the excess background and adding a line border around the whole image. Answers that did not describe the tools e.g. one-word answers such as 'cropped' or 'resized' were not considered sufficiently detailed to gain credit.

(b) This question required candidates to explain why the features of the face in the altered image in Fig. 2 were more difficult to see. Good answers explained that, because the image was a bitmap and made up of pixels, and/or had been compressed there was a loss of pixels which, combined with possible compression artefacts, made the image 'blocky' with a lack of fine detail. Poorer

answers did not explain the reasons for the lack of detail or simply stated that the image was a bitmap with no further comment. Answers that give simple statements to questions asking for explanations will not score many, if any marks, so centres should encourage their candidates to customise their answers according to the command words in the question.

Question 2

This question was answered very well. Most candidates scored the marks. However, there were a few that transposed their answers and did not score the marks.

Question 3

Most candidates could describe the features of Bluetooth® technology demonstrating an understanding of its use in communications between devices. However, the question required candidates to do more than describe Bluetooth® technology, candidates were expected to detail the advantages and disadvantages and evaluate the use of the technology in the light of these. Answers that listed, as bullet points, the features of Bluetooth® technology or did little more than describe the technology scored few marks. Good answers referred to e.g. the minimal setup requirements and standard implementation in a range of devices and then explained why these were useful for communications along with e.g. the short range and limited bandwidth, imposing restrictions on the uses.

Question 4

This question was not just about the use of robots in factories but about how the robots are 'taught' the procedures and positions for a task which, in this case, was the fitting of windscreens to cars on assembly lines. Good answers referred to using GUI and/or text-based commands to specify the position where the windscreen must be fitted, mapping the positions in a graphical format, using a hand-held control to move the end-effectors of the robot and recording the movements, and programming the robot with coded commands while it is off-line. Answers that did not include sufficient details e.g. 'program the robot' did not gain credit. Questions that require candidates to 'describe' must be answered with full sentences and in some detail.

Question 5 (a), (b), (c), (d), (e) and (f)

Most candidates appeared to know the meaning of the JavaScript terms and could explain each term in some detail. Common errors, especially in part **(d)**, were to refer to HTML in the answers when the question clearly states that it is about JavaScript or to give an incorrect example. Candidates must be careful not to negate a good, valid answer with additional information that is wrong.

Question 6

Part **(a)** was only about how the configuration had changed while part **(b)** was about the increased security brought about by those changes. Some candidates muddled their answers between the two parts of this question which reduced their access to the available marks.

(a) Most candidates could describe the changes in the network topology from a single firewall to two firewalls. However, good explanations as to why this was carried out or the advantages of such a topology were rarely seen in the answers. Explanations should have included references to the placing of servers that were to be accessible to external users being placed behind the external firewall but outside of the internal firewall. This would ensure that the company's servers for email, FTP and web services were accessible from the internet but the internal servers were not accessible because traffic not specifically destined for the internal network would not be allowed through the internal firewall. The concept of a DMZ was rarely seen. A great many answers were vague with little detail e.g. 'having two firewalls gives double security' or 'having two firewalls means data is filtered twice'. Such answers did not gain credit here as they do not answer the question, lack detail or are superficial; candidates are expected to understand the 'role and operations' of network components.

(b) Good explanations included that an attacker could not be sure how many other firewalls would be found on the network. The extra firewall means that any attacker that gets past the first firewall would have to get past the second to access the company LAN and the external firewall security only has to deal with data from the internet. As noted in the report on part **(a)** many answers were vague with little detail e.g. 'having two firewalls means data is checked twice'. Again, simplistic

answers did not gain credit as candidates are expected to understand the 'role and operations' of network components.

Question 7

(a)   Some good answers to this question were seen. Candidates made valid references to the real-time collaboration of multiple users using web browsers over the internet. However, a considerable number of candidates mistakenly responded with descriptions of video-conferencing.

(b)   This question was about the internet technologies that enable web-conferencing to be carried out. Descriptions of e.g. TCP/IP connections providing end-to-end data communication, use of circuit switching, using HTTP/HTTPS as a protocol for the transmission and display of data were required from candidates. However, a few candidates described how web-conferencing is set-up and used and some described a video-conference. Details of extra hardware were not required by this question. Candidates must read the question carefully before answering it.

Question 8

In answering this question, candidates were expected to show that they understood the use of biometric measurement in a given scenario. Good answers examined, used the information given in Fig. 6 and gave detailed explanations of the reasons for and against using each of the methods or a chosen method. Some detailed answers with valid reasons from Fig. 6 were seen. A few candidates arrived at a choice that would not be sensible in practice, e.g. the use of DNA testing, but most used the information to support a valid choice such as fingerprint, retina or iris recognition because they are relatively easy to read, do not change over time and are acceptable to staff.

Question 9

(a)   This question required candidates to describe the benefits of using online tutorials and some good answers were seen. These answers included references to candidates learning from the tutorial in their own time and in their own familiar surroundings, while not having to waste time or money travelling to school or college. Customising tutorials and working at their own pace were also good answers. Vague references to 'not having to leave home' or 'cheaper' or 'free courses' without any additional expansion or comment did not gain credit as the answers were too superficial. Candidates at A Level are expected to be able to express their knowledge to some depth.

(b)   Some good answers to this question were seen. However, again as for part **(a)**, many responses were superficial and did not provide the detail needed to gain credit. Good answers included lack of motivation and lack of guidance from teachers. While a lack of access to technology, access to the internet or to suitable devices are valid points, it is considered that these are essentially the same reason so did not gain credit twice.

Question 10

This question was not simply about social networking and how it is used, but was about how the use of social networking has changed social patterns. Patterns such as the changes, and the effects of such changes, in how people interact with others e.g. friends and family, with politicians and government departments, the spread of different viewpoints, the social groupings, and the sharing of personal information with others could have been considered. A discussion of these points giving the positive and negative effects of changes would have gained credit. Once again, superficial answers that stated little more than how social networks are used did not score marks. At A Level, candidates are expected to have an understanding of the social implications of technology.

Question 11

There was considerable confusion between CAM and CAD, with descriptions of both being muddled together. This question was about computer-aided manufacture and an analysis of its use should have included e.g. the productions of items quicker than by manually operated machines due to the use of higher machining speeds; a greater consistency of the product because every finished product is the same; the fact that CAM can have a higher production rate because it can run continuously without much supervision, along with CAM being more expensive than manual machinery adding to production costs; and CAM programs

taking a long time to produce. An analysis should give detailed explanations of the main points or of the effectiveness of the process.

Question 12

This question produced some good answers from some candidates. Good answers included references to tools allowing planning and executing a project from inception to close, providing tracking of workers activities and the ability to move or reschedule tasks but also making simple projects more complex than they need be. Poorer answers were, again, lacking in detail and not addressing the question e.g. 'when to create the bridge' and 'project scheduling tools can be used to create a bridge' with answers showing little knowledge or understanding of the topic. Candidates are expected to have a knowledge of the tools used to schedule projects and an understanding of how they are used so that they can explain the main points in some detail.

INFORMATION TECHNOLOGY

Paper 9626/04
Advanced Practical

General comments

Whilst most candidates were able to make fair attempts at the graphics and animation tasks, many could improve results for all tasks by taking more care with the precision of their submissions. This is particularly important with respect to matching any illustrations shown on the question paper.

The database task involving the creation of calculated fields was only completed successfully by a very small number of candidates and centres may gain insight into these type of tasks by using the published mark scheme.

Comments on specific questions

Task 1

(i) In this part of the task, candidates were required to recreate views of a plate. This involved aligning shapes and using a gradient fill to create an impression of depth.

Their solutions were required to match the example shown in the question paper very closely and the screen shot should have included evidence that they had used guidelines to align the two views of the plate.

Good solutions showed that candidates had taken care to create:

● Concentric circles
● a gradient fill to match that shown in the question paper
● evenly spaced and carefully placed text
● a symmetric side view of the plate
● precise alignment of the sideview with the face view
● careful alignment of the inner limit of the gradient fill with the base.

Not many candidates took enough care to satisfy all the requirements and many seemed to have difficulty with a number of areas. The most common areas of difficulty were:

● Creating a circle rather than an ellipse
● ensuring the circles were concentric
● configuring the gradient fill for the correct start and finish shades
● fitting text to a path that spaced the text evenly between the circles
● matching the position and alignment of the views.

In particular, many candidates found maintaining the symmetry of the side view difficult.

Most candidates did save the required images in the correct format and good candidates managed to save the images at the correct size. Others needed to pay more attention to the options and parameters available when saving images.

(ii) Candidates were supplied with four images each containing two elements, an image of coloured bowls and an image of an uppercase character superimposed on the bowls.

Candidates had to determine whether each element was either a vector image or a bitmap image and describe how it was possible to determine the type of image.

![Cambridge Assessment International Education]

A simple description could be, "Enlarge the image and look for pixilation." Most candidates used similar descriptions and most avoided unsatisfactory references to images getting "blurry" or "fuzzy" when resized.

A common issue of which centres need to be aware, is that almost no candidates tried to describe an image that was comprised of both vector and bitmap elements. Descriptions such as "Hybrid" or "Mixed" would have been satisfactory.

(ii) For this part of the task, candidates had to examine the contents of an .svg file in a text editor and determine the parameters to alter in order to achieve a thinner inner circle.

Good candidates realised that the third radius needed to be increased and the better candidates were able to calculate the correct radius needed to reduce the shaded section by a half.

Given that many candidates did not attempt this task, centres might benefit from giving candidates opportunities to examine simple .svg vector images in a text editor.

Task 2

The animations were well done by the majority of candidates. The better candidates were careful about the precision of the size of the images, the position and range of the animation and the timings.

For the first part of this task, the question paper showed images of the animation of a spinning plate at the beginning, the middle and the end of the animation.

Many candidates could have improved their submissions by taking a little more care to ensure that their animation filled the stage as shown in the third image.

The second animation should have shown four plates falling to make a stack in the centre of the stage and some text appearing above the stack.

Almost all candidates made a fair attempt at this task and good candidates ensured that:

● The images of the plates appeared from the top and in the centre of the stage
● each plate was the same size and, in the proportions, shown in the question paper
● each plate took 2 seconds to descend smoothly
● the stack of plates was ordered correctly with each plate "inside" the one below
● each plate in the stack was evenly spaced
● the text appeared immediately after the fourth plate had settled
● the text was in a red serif font and centred above the stack of plates
● the animation restarted after 2 seconds.

The most common improvement necessary was that the plates needed to be evenly stacked and ordered so that each plate appeared to be inside the one below.

Centres might wish to prioritise providing candidates with practice in using layers in an animation.

Task 3

Not many candidates scored well in this task. They were required to import the data provided into a database and add two calculated fields to the table. Whilst almost all imported the data provided successfully, it is clear that most found the creation of calculated fields too difficult and resorted to inserting manually calculated values. Candidates need to be aware that since their actual database is submitted, evidence of their methods form most of the criteria for the marks to be awarded.

The first calculated field was to determine a duration. This involved using dates and times which candidates often find difficult. Centres may wish to provide future candidates with tasks that involve such calculations since these are common at both AS and A Level.

The second calculated field was more straightforward, and some candidates realised that even if they had inserted the Duration values manually, they could use a calculation to determine the Surcharge using the

criteria shown in the question paper. Some candidates displayed the results of the calculation in a query but still gained marks for the logic in the formula and marks for the accuracy of the results.

The last part of the task required candidates to create a form to display each record. Whilst most candidates created a suitable form, there were many candidates who did not attempt to configure the correct conditional formatting to display delivery times before 9 am as white text on a red background. At this level, candidates should find setting conditional formatting a relatively simple step.

Task 4

The task required candidates to recognise that the *.value* property of the Pword1 and Pword2 variables was omitted from the *if .else* statement so the password check code would not work. After correcting this omission, they then had to insert code to check the password length was at least 5 characters.

For candidates with some experience of writing/debugging JavaScript code this should have been a straight forward task.

There were many candidates who struggled with this task. Very few managed to submit a working solution and fewer still added comments to explain the error in the code supplied. It is clear that some struggled with the logic of the solution, but it is also clear that many did not have sufficient experience or practice with tasks such as these. Many centres may wish to prioritise preparing JavaScript practice tasks in order to improve candidate performance in this topic.

In conclusion

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

● Candidates should be careful to match the size, shape and position of images shown in the question paper and pay close attention to any specifications detailed
● the need to develop candidate expertise in the use and manipulation of gradient fills
● candidates need to be skilled in the use of layers in animations
● developing candidate expertise with the creation of calculated fields in a database table
● the provision of opportunities for candidates to work with date and time calculations
● developing candidate familiarity with conditional formatting in database forms
● providing experience in writing and debugging JavaScript code.