INFORMATION TECHNOLOGY

Paper 9626/12
Theory

Key messages

Candidates must not use trade names in the examination. Where trade names are used, these will be ignored, and the answer read as if the trade name was not present. Where the trade name has been given for a piece of software, for example, and the software type has not also been given in conjunction with the trade name, this removal of the trade name usually renders the given answer meaningless. In many cases, where candidates have given trade names, the points made by the candidate would have earned marks had a software type, rather than a trade name, been used.

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 cannot be read, examiners are unable to award 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. The use of what may be considered slang often renders answers meaningless. Terms such as 'sketchy', for example are not acceptable at this level.

General comments

The following are standard messages that are included in this report and have been for the past few series.

Every session, a number of candidates decide to not attempt questions. This is understandable, especially when the concept is a difficult one, but individual questions tend to be structured so that they have a variety of levels of demand within them. In effect, questions tend to have a range of answers, some of which may be considered more accessible than others. This is especially true of questions that carry more marks. Therefore, candidates should be advised to attempt to answer all questions. Whilst they may not know the whole answer, they may still pick up some of the more easily accessed marks that are available within a question. That having been said, the number of questions without any form of answer is diminishing.

Candidates' interpretation of command words is improving. Increasingly, questions that require an explanation are being answered correctly. In very general terms, where a question requires an explanation, the use of 'because' or 'therefore' in an answer will improve the candidate's chances of providing an explanation where required. However, candidates still struggle with the concept of justifying a concept. In order to justify, candidates should be presenting arguments in support of a concept. Arguments that attempt to argue that a particular concept is useless are not justifying.

Finally, candidates should be reminded to focus on the context of a question. If the question is set within a particular context, candidates need to consider the opportunities and restrictions that this context provides and structure their answers accordingly. They should then consider which aspect of that concept is being examined. The command word used can usually give a guidance here.

Comments on specific questions

Question 1

This first question assessed candidates' understanding of the difference between data and information. Candidates had to show how specific items of data could become information and support their arguments with examples.

This question proved to be extremely accessible for the vast majority of candidates. Marks were scored well here and it is clear that this is a concept with which candidate are very comfortable.

Question 2

This question was based on the short comings of using visual checking as a method of verification. The vast majority of candidates understood what visual checking was, with a significant proportion of that vast majority being able to provide a clear answer that achieved two marks.

Candidates who failed to achieve marks usually did so because they gave a definition of visual checking, rather than answer the question.

Question 3

This question was in two parts and focussed on malware. Candidates were presented with two types of malware and asked to describe each.

In some cases, candidates answered by describing the identified malware as a type of malware. Where candidates repeat the question, marks may not be awarded for that part of the answer. By implication, if the answer was based solely on the concept of malware, few, if any, marks were awarded.

In both cases, candidates occasionally struggled. For Adware, many candidates failed to mention that the fundamental rationale for adware was to increase sales, thereby increasing revenue. However, most candidates did identify that adware relied on popups.

For ransomware, answers were slightly more confused. Candidates were well aware of the fundamental concept of ransomware, but many were confused by the mechanics of the process. A significant minority of candidates suggested that ransomware steals the files and only returns them once a ransom has been paid. This is fundamentally incorrect. However, where candidates correctly identified other aspects of the answer, marks were awarded accordingly.

Question 4

This question focussed on the benefits of, and means of creation of, an expert system.

Many candidates confused the expert system with a real time tracking system. Candidates were told that the expert system suggested possible routes and seemed to assume that this was therefore a device located in the cab of the vehicle. As a result, many candidates suggested that the delivery company would be able to track the vehicle in real time and give updates on delivery times. Whilst a structured delivery plan may well result in more predictable delivery times, and suggestion that this was based on real time data because of the expert system, was incorrect.

However, where candidates realised that the expert system would produce a (probably) hard copy of the route for the driver to follow, and that this would be based on analysis of factors such as routes available, and knowledge of the items to be delivered, there were some good answers.

The second part of the question asked how such a system would be created. This caused some problems. Many candidates missed that this question was about the process of creating an expert system and focussed on the use of an expert system, or gave a generic description of an expert system, or, in some cases, how an expert system would produce the delivery list. Where candidates did fully appreciate the focus of the question, this still proved difficult, as few candidates were able to fully describe the process in any significant detail.

Question 5

Question five focussed on validation checks that could be applied to two separate items of data. Candidates were asked to justify additional validation checks that could be applied to the two separate items of data. Candidates were informed that presence checks had already been applied.

In questions such as this, context is important. For example, a student number is unlikely to be validated with a range check, as candidates were not given a range. Similarly, a length check would be inappropriate for this data, as, again, candidates were not given any indication of the range of numbers involved. Unfortunately, a number of candidates suggested these as possible answers.

For the score, candidates identified checks that could be applied to ensure that the scores entered were within the correct range of scores. However, candidates need to be careful that they are describing the correct test. A range check has an upper value and a lower value. Both must be stated. A limit check has one value.

Where candidates have given incorrect values, or insufficient or excess values for validation checks, marks were lost for the descriptions

Overall, many candidates did well on this question, but, as implied above, some candidates are missing marks through misinterpretation of the question, or through misapplication of tests.

Question 6

Questions about the digital divide often result in fairly exotic and imaginative answers. Unfortunately, these are often too outlandish to be accepted. Candidates should be encouraged to work within the restrictions of the syllabus for questions on this topic. For example, the cause of the digital divide in rural areas is often to do with the relative remoteness from urban areas. It is also true that wages tend to be lower in rural areas.

However, these two causes of the digital divide are beyond the range of issues over which a local government can influence control. Therefore, in questions such as this, answers such as ‘introduce a minimum wage’ are not accepted. Candidates are better advised to answers with ways in which the digital divide may be alleviated. Therefore, for example, local government may operate local digital cafes. These would operate as places where people may experience something they may not otherwise experience or may simply provide a location where people may access the internet.

Question 7

This question focussed on the use of spreadsheets to track students’ progress over time. The question did not ask for discrete features that are unique to spreadsheets and so answers to do with storing data were acceptable. For example, storing data in a table, with dates as a heading, could be used to store scores which could then simply be looked at.

Other possible answers included using the sort feature, to place scores in order. Again, this would show if scores were increasing or decreasing.

Many candidates did well on this question, but a significant number gave repeating answers, such as that they would calculate the changes and identify a percentage change, or a raw number change. This answer focuses on the use of spreadsheets to calculate and is a repetition of that one feature of spreadsheets.

Question 8

Candidates often struggle with technical questions and this question fitted that generalisation. In some cases, candidates tried to explain why IPsec was used, which was not answering the question that had been set, whilst others tried to explain what it did, but in general terms. Fundamentally, the use of IPsec is to secure data as it is being transferred across a network. Where candidates started from this point, they usually scored well, but such candidates were quite rare.

Question 9

This question focused on the use of the delete utility and was again, a technical question with which candidates struggled. Many candidates gave weak answers that basically stated that the delete utility deletes files. The question asked how the utility works, not what it did. Even if that had been the question, few marks would have been awarded as many candidates repeated the concept of deletion.

Where candidates gave technical answers, these were occasionally very good indeed and involved detailed explanations of the removal of references from the directory table, so files could not be found.

The second part of the question asked why files may still be recovered once deleted. A significant minority of candidates stated that the file could, be retrieved from the backup facility, which did not answer the question. However, other candidates who stated that the file could be found in the recycle bin, were awarded a mark. Many candidates gave good descriptions that showed that they were fully aware that the file effectively still exists until overwritten and so could be accessed quite easily.

This question brings out one further point. At this level, candidates need to be using terms accurately. Deleted files are available in the recycle bin. Many different terms were used for the recycle bin, and very few alternatives were accepted. The term ‘recycle bin’ is a technical term and needs to be treated as such.

Question 10

This question focused on the use of sound editing software. As with questions about the digital divide, such questions can result in many different and imaginative answers. In the case here, candidates were asked to explain two terms as applied to audio clips. Where candidates had a good understanding of audio editing, neither question proved to be a significant challenge. However, this was the case with relatively few candidates. The majority of candidates gave extremely vague answers that were not sufficient for marks to be awarded, especially for the question on normalisation.

Question 11

This question focused on the use of simulators to give driving lessons. Again, some candidates made somewhat wild and unsupportable claims. For instance, some candidates claimed that simulators saved the business money. Whilst cars may be used less, there is still the issue of the cost of the simulator itself, so such a claim is difficult to support.

In answering questions such as these, candidates should be encouraged to think about what is actually occurring. The learner driver is using a simulator to practice. The use of simulators implies the use of programmes, which can be repeated ad nauseam until the learner has showed mastery. Each attempt at the simulation can be analysed, because the attempt can be recorded. The recording can be played back later and further analysed.

Such analysis of the process then affords the candidate with opportunities to suggest benefits and drawbacks. As an approach to answering such questions, this is more likely to be successful than generic answers about saving money, or reducing risk.

Question 12

The final question asked candidates to produce a program flowchart. This question was successfully answered by many candidates.

However, some issues appear repeatedly with such questions. Firstly, decisions need to be based on questions, and each decision has two outcomes. These outcomes may be yes/no, or true/false, but they must be shown and labelled.

Secondly, candidates continue to use the wrong symbols. Fortunately, this situation is improving, but it remains an issue. Candidates need to use the symbols provided by the board and should have practiced using them correctly.

INFORMATION TECHNOLOGY

Paper 9626/02
Practical

Key messages

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

- 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.
- Candidates must save or export files with the specified file names and file types. As per guidance, file formats not specified in the question paper will **not** be marked.
- Candidates need to understand the requirements of databases designed to First Normal Form (1NF).
- Candidates need to take greater care when examining data files that will be used to create a normalised database and ensure that appropriate duplicate data is removed to achieve 1NF.
- Candidates need a better understanding of the conventions for naming fields within a database.
- Candidates need a better understanding of applying appropriate data types to fields in a database, particularly to fields containing numeric data that would not be used for a calculation.

General comments

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

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 set 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 started after 2 seconds, although a small number erroneously removed the contents from the first 2 seconds and replaced it with a black background. Most candidates removed the end of the video clip as specified in the question paper. A number of candidates found changing the speed of the video clip as specified more challenging with some candidates speeding up rather than slowing down the clip. 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. The file credits.png was frequently seen as an image cropped from the original rather than resized. This file was not always set to the same frame width and height as the video clip created and was not always saved with the correct case on the file name A number of candidates incorrectly saved the file as .png.png.

Question 2

Many candidates successfully set the video to the timeline, with text as shown in the diagram on the question paper. A significant number of candidates did not left-align the text within the text box or use a sans-serif font. Despite clear instructions to only use transitions if instructed a number of candidates used them throughout the presentation. In doing so it was impossible for Examiners to credit marks for the timing of elements as the transitions changed this. A number of candidates did not place a gap of one second between 6 and 7 seconds where only the background was visible. Where (at 11 seconds) candidates had

applied a transition, this was not always a dissolve transition. A diagram was supplied to assist creating the background at the 41 second interval but not all candidates cropped the image so that only cells A1:E5 were 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. A small number of candidates did not export the video and supplied project files which could not be assessed.

Question 3

Most candidates created a spreadsheet that looked like the image provided, although sometimes column widths would appear significantly different in columns A and E. Most candidates used a sans-serif font, but often this was the default font, as they tried to enter a font name of 'sans-serif' which does not exist. Cell borders were usually displayed but occasionally these were the default line widths instead of thick cell borders. A number of scripts had lower case letters rather than upper case as specified. Data validation was frequently correct, although some candidates did not set the same rule for all 9 active cells. Some candidates omitted prompts and error messages from their validation rules.

Question 4

The use of formulae within conditional formatting proved challenging for many candidates. The instruction to use eight rules was frequently ignored (one for each correct solution) and a range of different candidate responses was seen. Many candidates attempted to set one (or two) rules for each correct range of three cells and many different correct solutions were seen including the use of AND, nested IFs, OR, COUNTIF and solutions using duplicate values. Some candidates were not always successful in trapping out solutions where three blank cells would display the green background.

Question 5

Most candidates created the Evidence document as specified, although not all named this file as instructed. At this point many candidates then found the creation of a test plan challenging, few understanding that the test plan should have initial information about the type of test and what is being tested, despite the three bullet points identifying exactly what the Examiners would be looking for. Some marks were often attained for these elements, but few candidates then went on to show understanding of the tabular nature of test plans with the items (cells) to be tested and expected and actual results as column headings (often with remedial action taken which was not assessed on this paper). Candidates were then required to select appropriate test data for these tests. As each of the three cells within the test plan could hold O X or a blank cell there would have been 27 (3^3) possible sets of data entry. This was rarely seen although some candidates did produce some of these tests. Results were frequently shown where candidates had produced a tabular plan, although it was acceptable to include screen shots for the actual results the expected results should not have included screen shots as the planning should take place before the testing is completed. This question proved the most challenging on the paper.

Question 6

Many candidates did not demonstrate the underpinning knowledge of normalisation to the first normal form that was required to answer this question fully. A significant number of candidates did not create atomic fields for the names, address elements (including the zip code) and for the two elements of the telephone numbers. Each record must be unique for 1NF so duplicate rows should be removed ensuring that the customer number field would contain unique values and therefore become the primary key field. A number of candidates did not recognise this and added an extra ID field to their data dictionary. The data dictionary should have contained all of these atomic fields as well assigning appropriate data types to data such as the zip code, area code and telephone number, which, even though they contained numeric data would never be used for calculations so should be stored as alphanumeric data types. A significant number of candidates did not use appropriate naming conventions for their field names, often including spaces in their field names or making them excessively long. Some candidates provided no field sizes for any of the fields in their data dictionary and those that did often incorrectly included sizes for fields identified as numeric. A small number of candidates did not create the data dictionary in the Evidence document as instructed but saved it as a separate file. This question gave an excellent spread of marks.

Question 7

Candidates who recognised that unique rows were required for 1NF successfully removed the duplicate customer records from the given data file. Most candidates sorted the data as specified (which made their task of checking for duplicate data much easier). A few candidates lost the integrity of the data by sorting on the customer number field without including the other data. Fewer candidates set the fields as atomic data whilst retaining the leading zeros in the area code data.

Question 8

Most candidates that successfully created a database did not carefully check that all field names, data types, primary keys and field sizes specified in the data dictionary (created in step 6) were matched exactly in the database. This should have included spelling and case. Data and structures in the database did not always match the data file saved in step 7.

INFORMATION TECHNOLOGY

Paper 9626/32
Advanced Theory

Key messages

Centres must ensure that learners are able to customise their responses according to the command words in the questions. Learners who write answers that do not address the command word do not have access the full range of marks. The command words used in questions are carefully chosen to give learners the opportunity to show their wider knowledge and their understanding of IT topics and to demonstrate that they can meet the Assessment Objectives. Assessment Objective 1 (AO1) requires learners to recall, select and communicate knowledge and this is tested by such command words as e.g. 'state, 'describe' and 'explain' whereas Assessment Objective 3 (AO3) requires learners to use their IT knowledge to analyse, evaluate, and present reasoned conclusions. The command words are shown on page 66 of the current (2025–2027) syllabus.

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 learners study all the content of the subject topics. It is important to note that the syllabus (page 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 learners that the number of marks available for each question is a useful indicator of how much detail or how many descriptions should be given in the answers. For example, **Question 9 (a)** has four marks available for descriptions so a single statement is not sufficient for full marks.

General comments

Learners 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 usually adequately answer the question. Further, if these answers are shown in a sketched table, they do not properly answer the question as there is no e.g., discussion.

Centres are advised to remind their learners to carefully read the whole question before attempting to write their answer. 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'. The full range of marks is only available to learners for answers referring to the question scenario. For example, **Question 10** was about the phased implementation of point-of-sale terminals in different areas of a department store and not about replacing the different parts of a computer system.

Comments on specific questions

Question 1

This question was about HTML events and how JavaScript can use them to make web pages interactive.

(a) An HTML event is a change in a web page caused by a user or by the browser. Many learners referred to the user action but most did not correctly refer to the change in the web page. Common errors included inaccurate references to scripted dialogue boxes and alerts.

(b) A common error in all parts was to reword the question. This is, in effect, repeating the question which does not gain credit.

(i) Good answers referred to the mouse pointer moving over or into an area of an element on a web page.

(ii) Good answers referred to the mouse pointer moving from or out of an area of an element on a web page. A common error was to state that the event happens when the pointer is 'not over' the element of area. Such an answer is inaccurate as it implies that the mouse pointer could be anywhere on the screen to trigger the event. Answers must be precise in their meaning to gain credit.

(iii) The important point is that the web page must be ***fully*** loaded into the browser to trigger the HTML event.

Question 2

This question was about peer-to-peer networks. While most learners could answer the questions quite well, a significant number erroneously focussed their answers on the use of peer-to-peer networks for illegal file sharing activities.

(a) Network architecture refers to the design of the network and how nodes interact to e.g. share resources. Good answers would have referred to e.g., the lack of a central server, all peers being of equal status on the network and to each peer acting as both server and client. Many learners referred to the lack of centralisation but many also erroneously described uses of peer-to-peer networks.

(b) Good answers would have referred to benefits such as e.g., the lack of centralised monitoring and control, the reduced need for specialised technical knowledge and to the failure of one node not affecting the other nodes in the network. Drawbacks that could have been mentioned included e.g., the lack of a central backup so all nodes/peers are responsible for their own backup, the increased risk of spreading malware and the reduced security of data stored on the peers. Common mistakes included descriptions of uses, inaccurate references to network performance and to illegal activities.

Question 3

This question was about virtual servers and server farms but some learners confused these with cloud computing and remote access to servers.

(a) A description of a virtual server should include that it is a software instance of a server and e.g., virtual servers run in RAM and share the hardware of other virtual servers. Common mistakes were to omit the software and RAM references or to state that virtual servers use no hardware at all.

(b) The most common answers was about a 'collection' of servers. Most learners, however, did not elaborate at all or did not accurately add that the collection of servers work together or have a central managing sever unit. A common error was to describe cloud computing.

In both parts **(c)** and **(d)**, a common mistake was to confuse virtual servers with cloud computing.

(c) Benefits that should have been mentioned include e.g., there is minimal disruption to services if a virtual server fails or is taken down for updates/maintenance as another instance can quickly take over and there can be reduced physical space requirements. A common mistake was to refer to privacy concerns.

(d) Drawbacks include e.g., the failure of the host hardware can affect numerous virtual severs at once and there exists the possibility of data leakage between virtual servers running on the same hardware. Common mistakes include reference to costs such as set up costs and on-going rental charges or to third-party data security issues, the latter being more associated with cloud computing services.

Question 4

This question was about frames in animation and, while it was clear that learners had some experience of these, most could not accurately describe a frame. There was confusion in the use of terms associated with animations e.g., element, object, canvas, timeframes were muddled.

(a) A good answer should have referenced that frames contain objects and their parameters and are part of a sequence. A common mistake was to describe the creation of an animation by an animator.

(b) A common mistake was to refer to the speed of a whole animation and not to the movements of objects within an animation. Good answers should have referenced the effects of increases and decreases in the frame rate on how an object appears to move in the animation.

Question 5

Descriptions of the OSI model of networking were not required. The question was about the functions of one specific layer: the presentation layer. Details of other layers did not gain credit. Good answers focussed on the preparation of data in readiness for transfer to adjacent layers.

Question 6

Learners are expected to have knowledge and understanding of the components of PERT charts.

(a) (i) Descriptions of how float is calculated did not answer the question. A key point about float is that it is the amount of time that a task can overrun before affecting the succeeding task(s).

(ii) Some learners confused milestones and goals. A milestone is a point at which certain criteria are met or a target on the way to achieving a goal whereas a goal is an intended target that should be achieved in a given time frame.

(b) (i) The most common mistake was to repeat or reword the dependency stated in the question.

Another common error was to state that ‘there are no dependencies’. Other dependency types include e.g., finish to finish and start to finish.

(ii) This question was about how dependencies can be used. Most learners referred to determining the order of tasks and to the allocation of resources.

Question 7

The command word ‘discuss’ is defined in the syllabus (page 66) as to ‘write about issues(s) or topic(s) in a structured way’ so learners who produced bulleted lists or tables of statements were unable to access most of the marks. It is essential that answers reflect the command word in the question if they are to access the full range of available marks.

This question asked for discussion of the ‘impact’ of technology enhanced learning (TEL) on student achievement so answers should have focused on how TEL can affect this. Descriptions of different types of TEL, statements about benefits or drawbacks gained little or no credit without further comment on how these can affect the *achievement* of students. The published mark scheme gives some examples of the positive and negative impacts that could have been given in answers.

Question 8

This question asked for descriptions of benefits and drawbacks so there was no need to provide lengthy descriptions or explanations what digital base money is. Vague answers about being 'dependent on internet access' or 'not being available if the server fails' gained little or no credit. At A level, answers need to be more focussed on the question scenario and demonstrate depth of knowledge such, in this case, digital base money e.g. provides a digital alternative to cash, is beneficial for those with limited access to traditional banking services and provides a secure digital payment service but it allows increased surveillance of financial transactions which could raise privacy and security concerns.

Question 9

Descriptions of the Internet of Things (IoT) were not given credit unless these referred to an actual use or drawback. For example, stating that the IoT can connect a refrigerator to the internet was not sufficient for a mark unless a use for this connection was described e.g., to automatically order replacement items. At A Level, learners are expected to provide more detail in their answers.

(a) A range of good answers was seen e.g., for creating automated home systems that regulate/control heating or lighting and the automatic re-ordering of provisions by household appliances.

(b) The question asked for drawbacks, i.e., more than one, and the total number of marks available was four so learners were expected to provide detailed descriptions of several drawbacks to be able to score the full marks. Centres are reminded to draw the attention of their learners to the mark tariffs of questions. A range of valid drawbacks was seen including references to privacy concerns raised by listening devices e.g., voice-controlled digital assistants, or television systems, unwanted automatic placing of orders by smart devices and the possible reduction in human skill sets caused by overdependency on connected smart devices.

Question 10

Some credit was given for accurate descriptions of the two methods of implementation in the question scenario but here was much confusion by learners between the different methods. This confusion was evident throughout the responses with advantages and disadvantages of phased, direct, parallel and pilot implementation being muddled together.

As for **Question 7**, learners who produced bulleted lists or tables of statements were unable to access most of the marks. It is essential that answers reflect the command word in the question if they are to access the full range of available marks.

The question was about phased and direct implementation of new point-of-sale terminals in a department store. Many candidates mistakenly referred to the phased implementation of parts of computer systems so it essential that Centres remind learners of the need to read the question carefully.

The question also asked for both advantages and disadvantages so the full range of marks was only available if responses contained references to both. Advantages include e.g., the new terminals can be tested and evaluated in one section/department before replacing terminals in the others and fewer / less technicians are needed to install the terminals compared to direct changeover whereas disadvantages include e.g. the complete changeover in all departments to new terminals can take considerably longer than a direct changeover all at once and there is no fallback option in the departments where terminals have been replaced.

Question 11

The command word ‘analyse’ means to *‘examine in detail to show meaning, identify elements and the relationship between them.* Learners are expected to be able to use their knowledge and understanding of, in this case, vector graphics and examine the use of these on a website. A small number of learners confused vector with bitmap graphics and gave very poor answers. Descriptions of vector images were not given credit unless these descriptions were used to explain why vector graphics are, or are not, used on websites. For example, a description of a vector graphic being produced by calculating angles and lines from instructions did not on its own gain credit but if this was used to explain that these e.g., take up less storage space then credit was available. Vague references to ‘vector graphics make the site look better’ or ‘look attractive to students’ did not gain credit. A good answer would have referred to e.g., the lack of pixelation when rendered in different resolutions or sizes making the graphics more suitable for display on a range of different devices, photographs not looking realistic when created as vector graphics or small errors being more visible in vector graphics and so spoiling the image.

INFORMATION TECHNOLOGY

Paper 9626/04
Advanced Practical

Key messages

One of the key points that centres should emphasise to candidates is the importance of attention to detail and precision. Formatting and the precise placement of text and images might appear secondary compared to the technical skills needed for the task, but they can make a significant difference in the final score – potentially pushing it across a grade boundary.

General comments

The majority of candidates showcased a suitable level of competence and successfully completed all the tasks. While there were a few recurring challenges that some struggled with, overall, most appeared well-prepared for the examination.

Comments on specific questions

Task 1 – Data Analysis and Visualisation

The first part of the task involved formatting some data so the scope of the task could be recognised. Other parts of the task also required candidates to format cells and chart elements as shown in the question paper. Many candidates lost simple marks because the formatting was not sufficiently precise.

The essence of the task was to perform specified analysis on data selected by a drop-down list, and display results as a chart.

The lookup to display the selected data caused no problems for most candidates. It is worth noting, however that whilst candidates who used XLOOKUP() automatically displayed the correct number of rows, candidates who used a different approach using INDEX() and MATCH(), for example, sometimes extended the column beyond the data range or did not display all the rows.

Analysing the data by determining the frequency of marks within intervals was done completely by only a few candidates.

The intervals were to be selected and restricted to 5 or 10 marks. Almost all candidates set the correct validation rule and most recognised the good practice of adding appropriate messages.

Creating the table to display the lower limit, the upper limits and the resulting range proved problematic for a large number of candidates. The values in each column had to be restricted by the maximum test score which was entered in cell E2.

Most candidates managed to set and increment the limits to either 5 marks or 10 marks when selected and concatenate the values accurately for the range but many did not manage to restrict the increments to the maximum test score, particularly if it was reduced.

The calculation of the frequency of scores in each range was not attempted by all candidates which is surprising since it could be achieved using the COUNTIFS() function. All candidates need to be familiar with this function.

A surprising number of candidates attempted to use the FREQUENCY() function but many either misused the function or misunderstood the task and created cumulative values.

Using the FREQUENCY() function has advantages since it is an array function and will display result to match the data ranges (called 'bins' in the tool tip). The COUNTIFS() function had to used as part of an IF() statement in order to match the number of non-empty rows.

Creating the chart was fairly straightforward and posed no problems for candidates who did manage to create the frequency data. Once again, attention to the formatting of the chart as shown in the question paper was important. Candidates must pay attention to details like the orientation and colours of elements, titles and labels and which chart elements are shown or omitted.

Very few candidates were aware that titles can be changed to cell references and that the chart title could be set to equal the contents of cell B2. This enables the chart title to dynamically match the name of the college selected for the chart.

Task 2

(a) Vector graphics

The creation of the jigsaw piece was done fairly well by all candidates and most managed to produce an image within acceptable tolerances for the proportions and positions of the cutout and extrusion.

Very few, however, created the image at the correct size. Candidates, often correctly, may regard vector graphics images as independent of size. Whilst this does apply to scaling, they must appreciate that these applications can create images with very accurate dimensions.

The accuracy of the proportions of candidate images was tested by the requirement to duplicate and rotate the image and fit 4 images together.

All candidates produced the completed image but some lost marks by not being able to align the images with enough precision. Candidates who recognised that the pieces did not fit together well may have taken the opportunity to refine their original image and gain the marks for accuracy.

(b) Raster graphics

Candidates had to use their jigsaw piece image to cut a bitmap into four pieces. This entailed sizing the piece to match those shown in the question paper and using tools to crop the bitmap to the shape of the jigsaw piece.

The next part of the task required candidates to fit the piece together to reassemble the original image. At this point it became clear how accurate the cropping had been.

Some candidates did not know how to crop the image to a shape. Some resorted to erasing the image around the shape. Some attempts at this method were remarkably accurate but it was clear when this was attempted because often there were no outlines to each piece.

Nevertheless, it is clear that most candidates were well prepared and skilled at graphics tasks.

Task 3 – Animation

All candidates made a reasonable attempt at this task. The only issues that lost marks were the accuracy of the final position of each piece, the rotation of pieces 4 and 6, the fade in of piece 9 and the growth of the text.

Very few candidates took sufficient care with the end position of each piece so that the final composite image was sufficiently accurate. Candidates were supplied with each piece and with enough care, it was possible to fit the pieces together perfectly.

Pieces 4 and 6 had to be rotated in order to fit with their neighbouring pieces. The task stated that they needed to be rotated during the animation. A number of candidates rotated the piece beforehand.

The central piece, piece 9, had to fade in after piece 8 was fitted. It was clear that some candidates could not achieve this part of the task and either moved it in over the image or made it just appear.

In conclusion

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

- It is essential to emphasise the significance of carefully considering the formatting and placement of elements in spreadsheets, images and animations, as even small details can influence the final score.

Candidates would benefit from:

- experience the creation of dynamic chart titles
- producing vector images with precise dimensions
- cropping images to a prepared shape
- the variation of opacity in an animation.