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Computing 5511/6511

Report on the Examination

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- 5511 Advanced Subsidiary
- 6511 Advanced

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A2 Units

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CPT1: Computer Systems, Programming and Networking Concepts

Candidates were often unable to express themselves clearly and use the correct technical language. A common reason for candidates often not qualifying for marks is the frequent use of the word 'it'. A good example would be question 2(d) where the candidate's sentence started 'it is …' and the examiner is left uncertain whether it is the program translation stage or the execution of the program which the candidate is describing.

Good use of English and a reasonable standard of spelling were often lacking. Some questions on this paper were introduced with a simple scenario (e.g. Question 8) and candidates should frame their answers with reference to the scenario given.

The paper contained questions where candidates should have been able to relate to their own experience (e.g. Question 4) but still looked for the same level of understanding.

Question 10 asked candidates to write a piece of program code for the first time and this was a departure from previous papers. It is reasonable within the content of the specification to expect candidates to do this.

Question 1

(a) Although a new style question for this area of the specification, candidates mostly scored the full four marks.

(b) This was the first time this question had been asked and it was poorly answered. Whilst it is appreciated that candidates may well not have had practical experience of the use of library programs in their own programming experience after some three months, they would have experienced DLL files when installing software.
Common wrong answers were the confusion of library programs with either utilities, or a vague statement referring to information stored in a large archive.

Question 2

(a) Many candidates were able to explain that functions always return a value but few candidates were able to distinguish this from the way a procedure behaves.
For candidates who had covered this theory in a practical context this was an easy two marks. Candidates should have been exposed to a subset of the functions available in their programming language. The final part of the question stem "…or when using a generic software package" was intended to help the weaker candidates in triggering some of the functions they would have used; unfortunately, candidates often gave answers describing features of a generic software package.

(b) This question was generally well answered, although it was noticeable that the standard of answers varied between centres. Candidates who found the question easy were undoubtedly those who had practical experience of using functions which required none, one or two parameters when used.

(c) The most popular answer was to use identifier names for constants, followed by procedures and functions.

(d) This was well answered with most candidates able to score marks. The key word in the question stem was "advantage" and so answers required more than just a description of a compiler and an interpreter.

Question 3

The majority of candidates were able to recognise (a) and (b) as assembly language and machine code respectively.

(a) Very few candidates were able to suggest the numbers represented memory addresses, despite previous CPT1 papers asking candidates to explain the stored program concept where the basic concept of a program resident in addressable memory is fundamental to any computer system.

(b) Candidates usually failed to get the mark by being too vague with explanations such as 'Fig 1 was the same as Fig 2', or 'did the same thing'.
The required answer was the fundamental relationship between assembly language and machine code; namely a one-to-one correspondence between the instructions.

(c) This was poorly answered.

Question 4

(a) Most candidates scored the one mark.

(b) Although not examined on previous papers, candidates scored highly on this question no doubt able in many cases to draw on their own experiences.
Some candidates missed out on full marks with a weak explanation of the benefit to be gained – e.g. 'more storage' on its own is not a benefit for changing the hard drive.
A worrying misconception of a few students was that it is possible to change in isolation either the data bus or address bus.

(c) Again well answered with the majority of students able to suggest an additional component. Candidates who did not appreciate the meaning of PCB then wrongly suggested components such as DVD drives or an additional hard drive. More worrying were the candidates who suggested the additional component could be a motherboard or the processor.

Question 5

(a) Most candidates correctly gained the mark with a textbook style definition. Better answers were given in the context of the given scenario. To score the second mark the candidate had to suggest information which had resulted from the processing of the register data, and the majority were able to do this.

(b) Many candidates failed to read the rubric of the question and continued to frame their answer around the attendance application.
The key word in the stem of the question for both (i) and (ii) was 'data'. This is a good example of a question where, to gain marks, students must be able to express themselves clearly; an answer such as "the data captured from swiping a debit card" is worlds apart from an answer which vaguely suggests 'using a debit card'.

Question 6

(a) Due to an error in the question paper for part (i), examiners were instructed not to mark this part question. The total mark for the paper was therefore reduced to 64. Despite a different style of question for part (ii), the vast majority of candidates were clear as to what was required.
Common errors were a diagram which showed 9 lines instead of 8 or the lines drawn as 'tubes'.

Some candidates drew pulses on the lines instead of labelling each one with a 1 or 0 and still scored both marks.

(b) This was surprisingly badly answered with candidates either not clear as to what was being asked for, or not understanding the phrase "data representation". From past examination paper responses this appears to have been well understood previously. If the candidate has covered the specification content fully then it is hoped that students would be fascinated to learn how the same binary number can be interpreted in so many different ways: a basic machine code instruction to add two numbers together, a musical note, the colour of a pixel, one of the characters in a text string, one of several different number types etc.

Question 7

Most candidates scored well on this question.

(a) There were still some scripts where the candidates suggested a brand name such as Internet Explorer, and consequently scored zero.

(b) The question asked for 'features' and the majority of candidates were able to describe these. The common wrong answer was to just say what a browser does i.e. display web pages, and not describe specific features, which were generally well known. One-word answers however were very common.

(c) This part was well answered by many candidates.

(d) IP addresses appear to be well understood.

(e) Some candidates lost the mark with the inclusion of some domain name before the top-level identifier.

Question 8

There were some worrying wrong answers in both parts (a) and (b) of this question. Despite a clear scenario for the framing of the question, very few answers for part (b) made specific mention of points of detail from the stem of the question. For example, an answer which states "centralised storage of customer documents and contracts" is a much more convincing answer than "centralised storage of files".

(a) The two concepts that data signals need to be made compatible, and that each PC can be identified by other devices on the network was usually lacking. Network cards providing unique IP addresses was seen often. Even more worrying from a technical point of view is that many think the network card converts analogue to digital signals, confusing the function of the card with a modem. A vague statement about the need to 'connect' the PC with a network appeared frequently and scored zero.

(b) Only the better candidates could describe three distinct benefits. Many seem to think that software is shared; some went as far to say that you only need to buy one copy of a piece of software, clearly not understanding network licences or copyright issues. Sharing files, printers and access to the Internet from any terminal were the most common answers. Poor answers often gave general and imprecise answers such as "better communication" but not then saying how this would be implemented e.g. with an internal email system.

Question 9

(a) This has been repeatedly examined on previous papers and despite the comments in previous examiners' reports, candidates are still describing "bits of data" or "data sent byte by byte". Others think it is one-way data communication or describe asynchronous data transfer.

(b) This should have been an easy mark. Candidates should have practical experience of saving a bitmap image where there are a number of different colour resolutions possible. This is an excellent example where the use of binary numbers can be given a practical dimension. The understanding required is to make the connections that a 256-colour image will require 256 different numbers to represent each possible colour, and consequently 256 different numbers can be achieved with a single byte to represent each pixel.

Part (ii) was no more than a simple calculation requiring the fact that a kilobyte is 1024 bytes. Candidates should appreciate the full range of bitmap types; monochrome, 16-colour, 256-colour and 24-bit colour and the subsequent implications for the representation of each pixel.

(c) Well answered, again probably with candidates able to draw on practical experience of music downloads, etc. The most common misconception was the suggestion that the advantage was that you could download faster at the higher encoding rate. The disadvantage would then be poorer sound quality or lost bits/chunks of the sound due to interference.

Question 10

(a)(i) The use of GoTo statements has not previously been examined on this paper and most candidates struggled to suggest a single reason why this was poorly designed code, despite a large number of acceptable answers. The most common correct answers were that the use of GoTo statements gives rise to code which is difficult to follow and trace; there is no output produced when the SearchName value is not found; when there is more than one occurrence of SearchName in the PolicyHolder array, the program will output the number of claims value for the first occurrence of the name only.

(a)(ii) Few marks were obtained here with most candidates failing to give the bounds of the array for PolicyHolder or NoOfClaims, or omitting a data type for the identifier.

(b) Candidates should be able to write small amounts of program code in a unit that has the word 'programming' in its title. Knowledge of loops other than a For loop was rare. It was hoped that candidates would have constructed a Repeat – Until or While loop which terminated when a NoOfClaims value of 5 or more was found. Candidates who used a For loop were, however, still able to score the maximum 5 marks.
Examiners were not looking for the correct use of exact syntax for the language as stated by the candidate.

The use of IF statements was better understood, but this often did not extend to using an array index for the NoOfClaims as part of the IF statement. Very many candidates used the maths operator incorrectly, e.g. ≥ or more usually =>. Quite a few candidates reversed the logic testing for <5 and gave appropriate output for which they gained marks. Most popular languages seen were Pascal and Visual Basic but the candidates that used C on the whole answered the question very well indeed.

CPT2: Principles of Hardware, Software and Applications

This is the AS paper which covers the applications of computing and therefore a number of the questions are based on a described scenario. Candidates who read the particulars carefully before putting pen to paper were able to apply their knowledge and understanding to the context of the question and provided sufficient detail and explanation to gain credit. In this January 2006 paper, this was particularly relevant to questions 3, 5 and 6. Those candidates who used complete sentences in their responses usually revealed a better understanding of the topics and thus gained higher marks.

The examiners were pleased to note that the incidence of confusion over the technical terms field, file, table, records and entities in question 6 and file and record in question 12 was low.

Teachers are again asked to impress on their candidates that they will lose marks if an examiner cannot read their answers.

Question 1

Most candidates gained the first two marks available for this question but few gave a creditable answer to the third point. The label was a barcode, which would be read by a barcode reader or bar code scanner. 'Scanner' on its own was deemed insufficient. A few candidates suggested the use of an OMR. The advantages of having the label read by an input device rather than the code being typed in by the shop assistant were speed and accuracy. This was one of the very few occasions when it was decided to give credit to a one-word answer such as quicker or faster.

Candidates were then asked to give one advantage that a bar code has over a character code that makes it suitable for the identification of items in many different situations. Some candidates repeated their answers to part (b)(i), which suggested that they had not read the question carefully. Better candidates knew that the two main reasons for using bar codes rather than character codes are that bar codes can be read from any angle, unlike character codes, and can often be read even though partly damaged.

Question 2

Secondary storage is any non-volatile storage medium that is not directly accessible to the processor. Most candidates obtained one mark for this, mostly for stating that secondary storage is non-volatile. A few candidates defined secondary storage as portable, or as used for backing up data; neither point gaining a mark. Most of the answers that failed to gain even one mark appeared to be the result of a careless error, such as stating that secondary storage was volatile, or non-versatile. Most candidates correctly identified cache memory from the list as not being a secondary storage medium.

Question 3

In part (a), candidates were asked to suggest suitable input devices for three different situations. In the first situation, that of entering a patient's temperature, a sensor or thermistor was credited. A keyboard was accepted, although not welcomed, as it did not demonstrate that the candidate had really considered the options. A thermometer, or even a digital thermometer, was not sufficient as an input device unless the candidate stated that it would be connected to the computer. A digital camera might be used in order to input a picture of a skin problem. A webcam or mobile phone was also accepted if their use was explained. For a real time interview with a psychiatrist, a webcam or microphone was credited. A video camera was accepted if it was explained that that was connected to the computer. A keyboard or mobile phone were again accepted if it was explained how they were to be used for the task, and they had not been credited for an earlier use. Answers such as 'video-conferencing' merely demonstrated that the candidate had not read the question.

In part (b), some candidates lost marks because they confused the application described with a national NHS database, or they assumed that telemedicine was available in the home. A good set of answers to this part of the question was

i. 'Doctor has immediate access to specialist knowledge, despite geographical location',
ii. 'The NHS needs fewer specialist doctors spread around the country'
iii. 'Patients do not have to travel long distances to see a specialist doctor'.

The NHS could also save costs by reducing the number of patients who have to be transferred to another hospital for specialist treatment. General Practitioners would be more aware of their patients' condition. The patient could benefit by receiving a speedier diagnosis. It is sometimes not easy for a patient to travel to the required hospital and they might well be more relaxed in their local doctor's surgery.

Question 4

Most candidates gave two valid suggestions of the type of document for which a Desk Top Publishing application would be the most suitable, although letters was not accepted. A few candidates appeared not to understand the question, offering answers such as Word Processing software and Spreadsheets.

Many settings can be specified in Desk Top Publishing software apart from font details and if candidates did not get both marks for part (b), it was usually because their answers were too vague.

Question 5

Candidates scored highly in this question, although some ignored the instructions not to include the school, or Sam's name and address, and that each item of data must be one field of a record.

Question 6

In a flat file system, data inconsistency occurs when the same data item is held in two or more separate files and has different values in each. This is frequently because the data has been updated in one file but not in all. There were a number of examples of how this might happen in the file details given. Most candidates appeared to know the meaning of the term and gained at least two of the three marks available, losing the third, most commonly, by being imprecise; referring to data being held twice, or in two different places, for instance, without specifying that the data be in different files.

In part (b), credit was given for tables being normalised or linked in relationships or linked by key fields. Alternative correct answers referred to duplication of data being non-redundant.

Sadly, few candidates seemed to consider the advantages of a database over a flat file system for part (c). Many of the suggestions offered would be possible with a flat file system, such as producing invoices, or searching for details of a customer. Some candidates were clearly comparing the database to a paper-based system. Creditworthy answers included the ability to perform complex searches combining data from more than one table, the validation facilities available, the ease of updating the tables or of entering new details and the ability to add additional features or fields to the tables.

Question 7

Why is a spreadsheet suitable for the analysis of data? Because there is a library of formulae and functions and users can build their own libraries. Macros can be written to automate regular tasks. Graphs can be generated and data can be presented in a clear and organised fashion. Users can reference other worksheets and workbooks and can import data from other packages. The 'What If' facility is not really relevant to the analysis of data. Candidates also failed to be credited for answers such as 'There is a sum formula for totalling columns', or 'The ability to do calculations'.

Most candidates understood the process of sorting on two columns of data for part (b). In part (c), most appeared to know the reason behind the use of absolute cell addressing, although many found it difficult to put that knowledge into words. Only careless errors prevented candidates from correctly modifying the formula for cell C5. Most correctly applied the formula for cells C3 and C4, although some misread the question and provided the version of the formula for those cells.

Question 8

Data transmitted over a network is encrypted to prevent unauthorised users understanding it if intercepted, to prevent the message being altered if intercepted and to identify authentic users. It would not prevent the data from being intercepted; it would just be incomprehensible to any interceptor. A number of candidates gave the same reason in two different ways. 'So that if it is intercepted it can't be understood.' 'So that only authorised people will be able to decode it.'

The actual encryption exercise was correctly carried out by most candidates, although some confused rows with columns, and a few omitted the *s in their answer to part (ii).

Question 9

It was hoped that candidates who had not been specifically taught about the Regulation of Investigatory Powers Act (2000) would be able to identify it by a simple process of elimination. The scenario given did not fit any of the other Acts suggested so it had to be that one. Happily, that did indeed appear to be the case.

Question 10

This question uncovered the weakest topic area of the paper. The fact that batch processing often is scheduled for night time is not one of the operational characteristics of a batch operating system. Batch operating systems support processes that are sequential in nature, and once started, a process continues from beginning to the end with no interaction between the user and the computer (not 'Interaction is not needed'). Processes are queued and processed in turn. The process is controlled by instructions written in Job Control language. Examiners also accepted some answers that were relevant to batch processing, rather than the operating system, that data is usually entered off line, the processing is delayed until all the data have been entered (not 'collected') and that there is an acceptable time delay between the input of the data and the output of the results.

A hash total is a meaningless value, calculated purely for checking purposes, such as the total of all telephone numbers in a batch. A control total is a meaningful value such as the total 'total payable' for the batch. Other suitable fields for the hash total, then, would be Page or page number, Item number and Price. For the control total, other suitable fields would be Total Cost, P&P and Quantity.

These totals are calculated, often manually, before the data is entered, and the totals are entered on the batch header. At various stages during and at the end of the process, the computer will recalculate the totals and check them, to see that no records have been missed or processed twice.

Question 11

Most candidates appreciated that organisations set rules for acceptable passwords so that they will not be easy to guess or work out. Fewer candidates scored full marks for part (b). The better candidates realised that the characters in the alphanumeric string had to be converted into an equivalent numeric form (they were already in binary). These numbers then needed to be combined in some arithmetical way. Finally the numeric result needed to be mapped onto a two-byte integer, perhaps by using integer remainder division.

Question 12

Candidates were not expected to provide authentic program statements but, with the hint they were given, they were expected to provide a list of program-like steps or instructions. Many candidates who tried this question gained two or three marks, realising that the HelperIDs of each record needed to be compared with the ID of the helper to be deleted. If they did not match, that record had to be copied over to the file NewHelpers and the next record had to be read. This process had to be repeated until the end of the file Helpers. Then both files had to be closed and the file NewHelpers had to be renamed Helpers.

CPT4: Processing and Programming Techniques

General Comments

While this paper appears to have been a little more accessible than some others from the last few examination series, there were still a significant number of candidates who were clearly ill prepared for it. Candidate performance on some questions varied noticeably from centre to centre, suggesting perhaps that not all of the topics in the specification had been fully covered, and the appropriate techniques practiced, in time for the January examination. Having said this, the specification for this paper is both broad and challenging, even for the most able candidate, and requires the application of programming skills and problem solving as well as knowledge, recall and understanding. This makes the performance of those candidates (a significant number) who produced very good, sometimes excellent, responses to all of the questions both remarkable and very pleasing.

Quality of written communication is not assessed explicitly in this paper but a number of the questions did require both clear logical thought and well-reasoned and carefully expressed descriptive answers. The quality of this type of response showed an improvement on previous years. Handwriting skills, too, seem to be improving.

There was little evidence to suggest that any candidate under-achieved because of insufficient time to complete the paper.

Question 1

This question gave most candidates a good, often very good, start to the paper. Some candidates were confused about Binary Coded Decimal in part (b), and others muddled fixed-point notation with floating point. Surprisingly, the floating-point question (part (e)(i)) was answered correctly more often than the fixed point one (part (c)). Some candidates lost marks for partially correct answers through not showing all of their working.

Part (c)(ii) was not well answered. Many candidates mentioned improved precision or accuracy but failed to state that this also depends on the number of bits used for the representation.

Question 2

Although a short question, it proved difficult for most candidates. Many missed the point that both part (a) and part (b) were about the *implementation* of a stack, and in part (b) gave answers that were about applications that were suitable for a linked list or an array. However, we can note one particularly lucid answer to part (a)(i): “This is a static data structure with a finite pre-declared capacity.”

Question 3

Most candidates were well prepared for this question and some excellent answers were seen. This is one of the questions where the clarity of the response is very important. The question was about processes and the meaning of the term *process* was defined in the question. Therefore any answers that referred to a program or to a job were rejected. Some responses that referred to *tasks* were accepted so long as the context was quite clear and the answer otherwise correct.

In part (a) the examiners were looking for events or situations that would cause a process to leave the running state. Acceptable answers had to clearly relate to this: one-word answers, e.g. “interrupt”, were not acceptable.

In part (b) some very vague answers were seen and not credited: for example, "time needed" would not be awarded a mark. The answer needed to refer to a waiting process, and a characteristic such as "expected running time" had to be clearly stated.

Question 4

This was another question which most candidates found difficult, if not impossible. However, some good candidates produced very good answers.

Most candidates were able to answer part (a).

The examiners only rarely awarded full marks for the trace table. A lot of candidates abandoned the trace once they realised that the numbers were being output in ascending order. This limited their reward to two or three marks at best since half of the marks depended on the trace being completed. Many candidates had difficulty logging the procedure calls even when they made a good attempt at showing the tree in the T column.

Some candidates got the two marks for part (b)(ii) without attempting the trace while others who showed the right output in (i) called the procedure a search or a bubble sort.

Question 5

This question discriminated very well with the better candidates scoring high marks and most of the weaker ones managing to gain two or three marks at least.

Many candidates gained all four marks in part (a), while others lost one mark by referring to the registers by their initials only. Several inappropriate and some non-existent registers were named, while a few candidates did not attempt the question at all.

Part (b) was usually quite well answered, but a significant number of candidates where either inaccurate, or not clear enough, in their response to the second part.

Many good descriptions of the vectored interrupt mechanism were seen in part (c)(i), although a number of candidates did write about "executing the interrupt" rather than passing control to the start address of the ISR. Rather fewer candidates were able to suggest clearly why this mechanism makes the use of interrupts more flexible in part (ii).

Question 6

The inheritance diagram for part (a) returned two very easy marks for a large majority of candidates. The question then got harder but, as a whole, discriminated very well, indeed. In part (b) the examiners expected that the candidates would state that a public procedure should be inserted to set the colour. Where a candidate wrote of a function instead of a procedure the answer was condoned.

It was hoped that candidates would apply the concept of inheritance in part (c) and introduce functions GetCapacity and GetTailLift with an override of the procedure SetVehicleDetails. The candidates were also expected to choose suitable data types for the two new data fields. Since only six marks were available for the class definition as a whole it was marked quite leniently with regard to the use of Get and Set in the function names. In future examinations, however, similar questions may well be assessed more strictly. Even with the generous mark scheme only a few candidates obtained all six marks in part (c).

Question 7

Sadly, less than half of the candidates gained more than one mark on this question.

In part (a), correct use of the logical operators was rare, and many candidates left the operand in binary rather than hexadecimal. Very few correct solutions to part (b) were seen and it was quite clear that a large majority of the candidates for this paper had little or no idea about the use of assembly language.

Question 8

Parts (a) and (b) were made very straightforward for most candidates by the examples given in the stem, and in part (b) itself. Marks were generally only lost for inappropriate variable names and/or misuse of case in part (a). Extra punctuation was condoned in part (b) so the main cause of marks lost here was the introduction of a capital letter for laa and/or for daa.

The construction of a suitable rule in part (c) proved too much for all but the most able candidates. However, the mark scheme allowed credit for worthy attempts and near misses so a significant number of candidates obtained at least one mark from this part of the question.

CPT5: Advanced System Development

It was pleasing to see that candidates generally were prepared for most topics and few questions were unanswered, showing that centres teach all topics in the specification. However, of growing concern is the poor quality of language. Many candidates do not seem to be able to express themselves clearly and do not use technical terms where appropriate. This was especially noticeable in the questions that required more than just a key word answer, notably questions 3c, 5 and 7.

Question 1

Many candidates did not seem to read the question carefully enough and listed types of testing that would not be used in the early stages of software development. Candidates ought to be familiar with testing at early stages of development. They should be planning tests on their own CPT6 project: dry runs, module testing, black box and white box testing to name but a few.

Question 2

(a) Some excellent responses were found here such as: a database is a store of data and a DBMS controls access to the database.

(b) Most candidates were able to list the External, Logical and Internal Schema as the three levels of a DBMS.

Question 3

(a) Many candidates gained high marks on completing the diagram but most failed to realise that the Employee Master File on magnetic disk will be accessed for reading and writing and only drew an arrow in one direction rather than both. Some candidates did not seem to know the conventions of systems flowcharts and labelled the output boxes with 'paper' rather than 'printer'. A few did not spot that the Bank Transfer Details were on magnetic tape and labelled the storage symbol wrongly with magnetic disk.

(b) Many candidates could not name the diagram as a Systems Flowchart.

(c) (i) It was worrying to see how many candidates thought an ink jet or laser printer could print on multi-part carbonised stationery. Any impact printer would have gained credit.

(ii) Very few candidates could explain the principles of operation of such a printer and how the print would be transferred onto the lower layers of the stationery.

A dot-matrix printer has a print head that consists of a set of pins, which in combination produce the required character. The pins impact on the paper and the pressure makes a dot on the paper where the carbonised surface reacts to the pressure.

Question 4

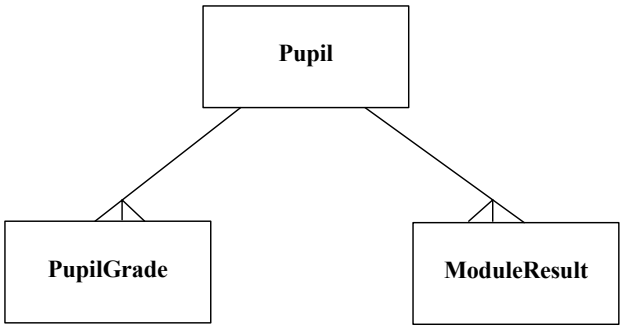
(a) Most candidates could identify the CandidateNumber as the primary key for ResultsTable.

(b) Many candidates are under the misconception that the example table shown in the question contained redundant data. Certain values appeared more than once, but this does not necessarily imply redundancy. The fact that there was another Ali Patel with a different candidate number is not data duplication either. The inclusion of this record was intended to steer candidates to understanding the importance of CandidateNumber as the primary key.

Other misconceptions were that any database consisting of a single table was by definition not normalised. Those candidates who could state that there was a repeating group of attributes gained credit. This repeating group of attributes were ModuleCode, ExamSession, ModuleMark, Level, TotalMark and Grade (they contain multiple values).

(c) A pleasing number of candidates could correctly identify which attributes belonged in which table for a fully normalised solution. However, it seemed to cause much more difficulty correctly identifying primary keys for these tables. Some candidates invented new attributes to act as primary keys. This did not gain credit.

(d) There are still unconventional ER diagrams in use. Candidates should show one-to-many relationships as below:



(e) The SQL is now generally well done. The majority of candidates gained 3 or 4 out of the 5 marks for the SQL statement. Most did not appreciate that there needs to be two criteria in the WHERE clause:

```
SELECT PupilForenames,PupilSurname, Grade
FROM Pupil, PupilGrade
WHERE Pupil.CandidateNumber = PupilGrade.CandidateNumber AND Level="A"
ORDER BY TotalMark DESC
```

Question 5

Many candidates could not tailor their answers to the given scenario and referred to scenarios in previous examinations.

(a) It was not sufficient to state the fact-finding techniques alone. Credit was given to those responses where the candidate gave some indication of how these would be applied to the given scenario. For example, interviewing teachers or cafeteria staff and observing how pupils currently keep record of what they eat and how it is decided whether the choice is a healthy diet would have gained full marks.

(b) Many candidates did not read the question carefully enough and responses that referred to the hardware in contexts other than for the 'Healthy Eating' system did not gain credit.

(i) scanning food was not enough to gain marks. A credit-worthy response was to swipe labels of pre-packed foods.

(ii) Merely stating that a label printer could be used to print labels was insufficient. To print labels for sandwiches or other foods to display barcodes or nutritional information gained credit.

(iii) Some candidates gained credit for noticing that the smart card could take over from the diary and store a pupil's food choices and/or dietary requirements.
Although smart cards could be used for payment, this was not given credit. The system was about healthy eating.

(iv) A creditworthy response for the use of a touch screen was so that food choices (especially those without barcodes) could be entered easily into the system

(c) Most candidates could give a method of conversion such as parallel, direct, pilot or phased. However, few could justify their choice adequately or correctly and so did not gain the second mark. Some of the better candidates correctly stated that since the system was not critical, a direct changeover was best as otherwise the cost of conversion would be too expensive. Pilot conversions were also popular, testing it first in one school before rolling out the system to all LEA schools.

(d) Many candidates seemed to have forgotten the 'healthy eating' scenario by this part of the question and listed tasks which would not be necessary in this system. There is no data to back up or existing hardware to upgrade. The data from the pupils' diaries would not be transferred onto the computer system. Creditworthy responses included setting up master files with data about nutritional information, issuing smart cards to all pupils, training staff and pupils and installing hardware and software.

Question 6

(a) Although peer-to-peer networking is now very popular, few candidates could adequately describe it. It was not sufficient that each computer could send to another without a server. In a true peer-to-peer network there are no dedicated servers. Computers function as both client and server.

(b) Although the question asked for a labelled diagram, some candidates did not gain marks because they did not indicate which of their drawn boxes represented a computer and which the switch and printer. Some candidates substituted the switch for a hub, which did not gain credit. Many others drew a standard bus topology, also not worthy of a mark in this question.

(c) Many candidates correctly stated that computer C was in a different subnet/segment to the others. Some candidates thought computer C was in a different network, for which no credit was given.
A pleasing majority of candidates correctly stated that the network ID of this network was 192.168.5 and that host IDs could be any value in the range 1-254. Credit was also given to those who stated the host IDs could be in the range 0-255, even though 0 refers to all addresses on the subnet and 255 is reserved as the broadcast address.

(d) Many candidates failed to give enough detail to gain credit. It was not enough to state that the router routes data packets from one device to another. Candidates needed to state that the router uses IP addresses to do this.

Many candidates correctly stated that 22.125.105.15 was the correct IP address of the two given, which needed to be registered with the Internet registrar. However, not many could state a clear reason. Responses that gained credit included: because the public address needs to be unique over the whole Internet.
Many candidates could identify that the default gateway IP address was 192.168.5.1.

Question 7

This question was either very well done, by those candidates who had a clear understanding of the principles involved, or very poorly done by those who only had a vague notion of how this important aspect of security on the Internet works.

(a) Many candidates found it difficult to express clearly what encryption was. A creditworthy response was converting plain text into cyphertext.

(b) Many candidates failed to realise that both A and B had a private and a public key. The answer therefore needed to include whose public/private key should be used.
Sending a message that only B can understand must be encrypted using B's public key, so that only B's private key can decrypt the message.

(c) There seems to be much confusion as to what a digital signature is and the role of a digital certificate. Here is an explanation:
So that the digital signature will show up any tampering of the original message, the digital signature is based on the (date-stamped) message: a hashing algorithm is applied to the text of the message. This produces what is known as a message digest. So that this cannot be substituted when the message is tampered with, it is encrypted with the sender's private key and attached to the message.
The recipient can decrypt the signature with the sender's public key.
To check that the message has not been tampered with: The same hashing function has to be applied to the received message and the resulting message digest compared with the decrypted signature (which was the message digest of the original message). If the two are the same the message is taken as being authentic.
However, how can we be sure that the sender's public key is genuine? This is where the digital certificate comes into play: The digital certificate will be sent with the original message. It includes the sender's public key, encrypted with the Certificate Authority (the trusted party)'s private key. So the recipient first has to decrypt the encrypted sender's public key using the Certificate Authority's public key.

Mark Range and Award of Grades

Unit	Maximum Mark (Raw)	Maximum Mark (Scaled)	Mean Mark (Scaled)	Standard Deviation (Scaled)
CPT1	64	64	30.4	9.6
CPT2	65	65	32.1	7.4
CPT4	65	65	28.5	10.8
CPT5	65	65	33.6	9.0

For units which contain only one component, scaled marks are the same as raw marks.

CPT1 (5313 candidates)

Grade	Max. mark	A	B	C	D	E
Scaled Boundary Mark	64	42	37	32	27	23
Uniform Boundary Mark	105	84	74	63	53	42

CPT2 (1940 candidates)

Grade	Max. mark	A	B	C	D	E
Scaled Boundary Mark	65	42	38	34	30	26
Uniform Boundary Mark	105	84	74	63	53	42

CPT4 (1840 candidates)

Grade	Max. mark	A	B	C	D	E
Scaled Boundary Mark	65	42	37	32	28	24
Uniform Boundary Mark	90	72	63	54	45	36

CPT5 (895 candidates)

Grade	Max. mark	A	B	C	D	E
Scaled Boundary Mark	65	43	38	33	29	25
Uniform Boundary Mark	90	72	63	54	45	36

Advanced Subsidiary award

Provisional statistics for the award (197 candidates)

	A	B	C	D	E
Cumulative %	9.1	21.8	49.2	76.6	93.4

Advanced award

Provisional statistics for the award (27 candidates)

	A	B	C	D	E
Cumulative %	7.4	37.0	66.7	88.9	100.0

Definitions

Boundary Mark: the minimum mark required by a candidate to qualify for a given grade.

Mean Mark: is the sum of all candidates' marks divided by the number of candidates. In order to compare mean marks for different components, the mean mark (scaled) should be expressed as a percentage of the maximum mark (scaled).

Standard Deviation: a measure of the spread of candidates' marks. In most components, approximately two-thirds of all candidates lie in a range of plus or minus one standard deviation from the mean, and approximately 95% of all candidates lie in a range of plus or minus two standard deviations from the mean. In order to compare the standard deviations for different components, the standard deviation (scaled) should be expressed as a percentage of the maximum mark (scaled).

Uniform Mark: a score on a standard scale which indicates a candidate's performance. The lowest uniform mark for grade A is always 80% of the maximum uniform mark for the unit, similarly grade B is 70%, grade C is 60%, grade D is 50% and grade E is 40%. A candidate's total scaled mark for each unit is converted to a uniform mark and the uniform marks for the units which count towards the AS or A-level qualification are added in order to determine the candidate's overall grade.