COMPUTER STUDIES

Paper 7010/11

Paper 11

General comments

The standard of candidates' work was slightly higher than that shown in June 2012. As with 2012, there are still some areas where improvements could be made, but the overall standard proved again to be very satisfactory. Two areas in particular where candidates continue to be weak are an understanding of how web sites work and questions which involve understanding how GPS technology works. However, questions involving trace tables and logic circuits proved to be very successful indicating some very sound teaching into the basic principles required for these topics.

There is also a continued move to questions where candidates have to apply their knowledge rather than just show their ability to simply remember facts. There is strong evidence that this is producing candidates who are now exhibiting a far better understanding and application of the syllabus topics than in past exam papers.

Comments on specific questions

Section A

Question 1

This question was reasonably well answered with most candidates adhering to the instruction to give four different examples of sensors. The main errors were centred on the usual incorrect sensors such as heat sensor or movement sensor, neither of which actually exist.

Question 2

This question produced a wide range of responses with the full range of marks from 0 to 6 being seen. The answers ranged from perfect pieces of code to answers which gave a description of what the loop did. A number of candidates were under the impression that IF … THEN and CASE … OF constructs were examples of loops.

Question 3

(a) There were no real problems here, however some candidates would benefit from further developing their knowledge of chat rooms and cookies.

(b) The standard of answers here was very variable. Some candidates gave excellent descriptions of the five terms whilst others produced unclear responses such as: "chat rooms are where people chat on the Internet" or "cookies give the user their Internet history" – neither of these answers explained the terms in a way which warranted any real credit.

Question 4

(a) This question caused very few problems. However some candidates would benefit from reinforcing their knowledge of ring and star network topologies as some did call part **(i)** a *circle* and part **(ii)** a *tree* or a *bus*.

(b) The majority of candidates gained marks for the benefits of networking computers e.g. sharing of hardware and/or software resources such as printers. However, very few gave acceptable answers for the drawbacks. Many answers were close, such as "risk of viruses/hacking" or "it is expensive" – neither gained a mark since the first answer needed to indicate that there was an ***increased risk*** from spreading viruses/hacking when networking computers and, in the second

answer, that there was an increase in cost due to cabling, special networking hardware and/or software.

(c) Candidates needed to improve their knowledge of this topic as most answers to part **(c)** were imprecise. Many candidates used the meaning of the letter "L" in LAN (i.e. local) or "W" in WAN (i.e. wide), and some thought the "W" in WAN meant it was wireless, clearly confusing this with a WLAN.

Question 5

The first and third applications were very well answered with no real problems to report. Many candidates did not realise that they were asked to give *hardware devices* and lost marks in the second application by just writing *RFID* or *microchip* – to gain the mark it was necessary to include the hardware device i.e. a ***reader*** of some description.

Question 6

This question gave the full range of marks from 0 to 5. Candidates seemed to find this way of answering questions on computer animation more manageable than having to write out definitions as asked in previous papers. To get full marks, candidates still have to have a very good understanding of the terms used in computer animation techniques.

Question 7

The first four parts of the question were fairly well answered. Most errors in parts **(i)** to **(iv)** were *double entry* (instead of verification), *interruption* (instead of interrupt), *interrupt* (instead of handshaking) and *printer head* (instead of buffer/RAM). Candidates needed to improve on their answers for part **(v)** as they gave incorrect answers such as parity checks, check digits and binary numbers.

Question 8

(a) A large number of candidates confused part **(a)** with part **(b)(ii)** and gave descriptions of functions appropriate to a house tour and not to an interactive map. Consequently, when they answered part **(b)** they had difficulties in finding answers that were sufficiently different to what they had already written. However, some good answers were seen with references to *ability to zoom in/out*, *use of "pins" to show exact location of the house* and *a scale to convert miles to kilometres*.

(b) In part **(i)**, a large number of candidates correctly gave *virtual reality*. Unfortunately, a significant number lost the mark by writing *virtual tour* or other answers such as *simulation* or *CAD*. Part **(ii)** produced a mix of good and weak answers (note the comment in (a) above).

Question 9

(a) Candidates seem better prepared for questions about expert systems. The majority of candidates managed to gain one or two marks here with a significant number gaining full marks.

(b) Candidates needed to further develop their understanding for this part of the question. Many candidates described devices such as touch screens or mouse as the features of the interface. Unfortunately, these candidates had misread the question and described what ***hardware*** could be used for the interface. This is a good question to reinforce the point about reading questions through two or three times before composing an answer, so as to ensure that the requirement of the question is fully understood.

Question 10

(a) Both parts were very well answered by a large number of candidates.

(b) Part **(i)** gave the full range of marks from 0 to 4. Many candidates wisely used the "working area" on the paper to arrive at their values for the output "X". Probably less than half the candidates, however, realised that the output from the logic circuit indicated that it could all be simply replaced by the input "C" and no logic gates needed to be used. In part **(ii)**, common errors were to see *flowchart, AND gate, NOT gate* and *nothing*.

Question 11

(a) This question was generally well answered by candidates. The only common errors were to give 225 (instead of 255) in rows 1 and 7 and to leave row 8 blank. Apart from that, most candidates gained 3 or 4 marks for the question.

(b) This question was well answered. Marks of 0 or 4 were frequently seen; there were very few candidates gaining 1 or 2 marks.

Question 12

(a) There were no real problems with this question, except it was fairly common to see 9 as the answer. Some candidates confused number of fields with number of records.

(b) The majority of candidates gave the correct three values here from the search condition.

(c) Candidates needed to improve on their answers to this question. Many candidates lost marks here for incorrect or careless syntax. If the wording in the search condition ***does not match exactly*** with the field headings in the table then marks are lost. Also a number of candidates confused the "<" and ">" signs and a number used the AND statement rather than OR.

Question 13

The full range of marks from 0 to 6 was seen in this question. The most common marks were 4 and 6. A considerable number of candidates confused items 8 and 9 which unfortunately lost them 2 marks. The majority of candidates read the instructions carefully and used the item numbers in the flowchart rather than write in the words. This makes it much easier for the Examiner to accurately check the candidate's answer.

Question 14

(a) The majority of candidates gained one mark here for realising that using three computers gives an increased margin of safety in case one of the computers fails to operate.

(b) This was answered reasonably well with a number gaining two or three marks usually for: sensors sending signals/data to the computer(s), signals need to be converted to digital (using an ADC) and the computer compares input with stored data. Very few candidates achieved a fourth mark for accurately indicating what decision the computer makes following its check on the input data. Marks were lost for the use of statements such as: "an ADC is used before data is sent to the computer" (no indication of what the ADC does) and "the sensors send information to the computer" (sensors do not send information). A number of candidates also suggested that sensors only take readings when some event happens or that the sensors do the comparison between actual speed and set speed.

(c) (i) Candidates need to improve on their knowledge of GPS technology. A number of candidates are still suggesting that the navigation system in the aeroplane SENDS SIGNALS TO the satellite which then works out where the aeroplane is. Also some candidates suggested that the navigation system in the aeroplane contains atomic clocks to ensure accurate timing.

(ii) A significant number of candidates forgot the stem of the question and gave benefits and drawbacks of GPS in relation to cars and not aeroplanes. Consequently, answers like "it re-routes the car if a road is blocked", "no need to read a map on your knee" or "if the maps are out of date they won't reach their destination" were all too common. Candidates needed to relate their answers to the scenario given at the start of the question.

Question 15

(a)/(d) These questions were reasonably well answered by the majority of candidates. The most common errors were the type of errors seen every year when this type of question is asked. Namely:

- use of "X" instead of "*"
- use of "÷" instead of "/"
- putting the name of the cell before or after the formula e.g. C4 = B2 – B3
- use of square brackets ( ) in formulas instead of ( )

In part **(d)**, the majority of marks were lost by not including brackets around the (C4 + C7) and around the (B6 * 12).

(e) This question was reasonably well answered. However, one or two candidates did not read the question properly and lost marks for giving the same validation check for B2 and B5.

(f) Some fairly general answers were seen here. A number of candidates did think carefully about how to answer this and correctly suggested working out the answer beforehand and then compare results with those obtained from the spreadsheet. However, the majority of candidates gained one mark for simply suggesting the use of *normal, abnormal* and *extreme data* to test out the validation routines.

Question 16

The full range of marks was seen in this question. There were some very good and ingenious ways of checking whether the value of "e" matched the check digit found from the calculation on values "a to d". However, many marks were lost for poor loop constructions or loops that had no end (which also meant candidates lost the output mark as well since this had to come once the loop had terminated) and for incorrect syntax such as (a*3) + (b*2) + (c*3) + (d*2) = TOTAL.

A number of candidates used flowcharts to answer the question. Unfortunately, it tended to be the weaker candidates who chose this route; consequently, very few answers of this type gained many marks.

COMPUTER STUDIES

Paper 7010/12

Paper 12

General comments

The standard of candidates' work was slightly higher than that shown in June 2012. As with 2012, there are still some areas where improvements could be made, but the overall standard proved again to be very satisfactory. Two areas in particular where candidates continue to be weak are an understanding of how web sites work and questions which involve understanding how GPS technology works. However, questions involving trace tables and logic circuits proved to be very successful indicating some very sound teaching into the basic principles required for these topics.

There is also a continued move to questions where candidates have to apply their knowledge rather than just show their ability to simply remember facts. There is strong evidence that this is producing candidates who are now exhibiting a far better understanding and application of the syllabus topics than in past exam papers.

Comments on specific questions

Section A

Question 1

(a) This question was reasonably well answered with the majority of candidates giving two valid examples of items to be found in typical technical documentation.

(b) This was similar to part **(a)**. The majority of candidates used very good exam technique here, and did not give the same items in both parts of the question.

Question 2

This question was generally well answered. Unfortunately, a number of candidates put more than one tick in each column and consequently lost the mark for that particular storage medium.

Question 3

(a) Candidates needed to further develop their answers to this question. For the type of internal memory used, many of the answers seen were often imprecise (e.g. "memory card" or "memory stick"). To gain the first mark, it would be necessary to elaborate on such answers – for example: *XD/SD memory card* or *solid state (NAND) flash memory.* Regarding the method of transferring data to the computer, the most common suggestion was the use of a data cable; however, unless it was specified that this cable connected to a USB port then no mark could be given.

(b) (i) Candidates needed to further develop their answers to this part question. There were many imprecise answers here such as "MP3 player has more space" – there has to be some reference to memory size to gain the mark; what does *space* refer to? However, the most common incorrect answer was to suggest that the MP3 player has better sound quality – if either device is played through headphones or a docking station there is no discernible difference between the sound qualities since the music is simply stored as a series of 1s and 0s.

(ii) Candidates needed to further develop their answers to this part question. There were some very imprecise answers here where candidates referred to "the size of the mega pixels". Some candidates gave weak answers such as the camera has more features – which features were they referring to?

Question 4

(a) This question was very well answered. The only "potential risk" which caused problems was *the laser printer's production of ozone and toner particles* – this is actually a health hazard, although several candidates thought it was a safety issue.

(b) Better candidates avoided giving health and safety answers in this part of the question. The majority of good answers selected *de-skilling, unemployment, training* and *more use of video conferencing* as ways that introduction of computers could affect the office workers. These candidates were clearly familiar with correct examination technique.

Question 5

This question did not appear to cause candidates any problem.

Question 6

(a) Candidates needed to further develop their understanding for this question. A small number of candidates seemed to think that it was possible to save data on the CD-ROM. Some candidates suggested that the data should be saved on a hard disk or CD-RW disc – however, this response is not enough since it does not really answer the question. A number of candidates also suggested that the problem with CD-ROM is that data can only be saved on them once only.

(b) Candidates needed to further develop their understanding for this question as there were some very weak responses. Very few candidates seemed to realise that the telephone line was needed to allow an external link to the Internet. Many thought it was needed so that it was possible for telephone calls to be made. A significant number of candidates missed the point of this statement and said that Wi-Fi allowed Internet access wherever you were.

(c) Candidates needed to further develop their understanding of this topic area. Several candidates clearly did not understand how GPS works. It was common to see answers that described the satellite as sending signals and then the car computer was bouncing the signals back and the satellite would then give the position of the vehicle. A small number of candidates even suggested that cars do not have GPS which is why the given statement was incorrect.

(d) The majority of answers indicated that there was no problem with time zones and email since the sending and receiving of emails is more or less instant. However, some candidates needed to further develop their understanding for this question, as few realised that the point of the question was that the recipient might not be available to receive the mail when it is sent and that a mail box was required to keep the message until the recipient wanted to access it. Unfortunately, a large number of candidates had clearly missed the point of the statement given in the question. Candidates would benefit from further developing their knowledge in this area.

(e) Many candidates discussed the difficulty of getting the hardware and the connection ready for video conferencing and ignored the fact that the time zones would make it difficult to have video conferences at any time. However, a significant number did state that different time zones would cause a problem and that meetings could actually be called at short notice.

Question 7

(a) Candidates needed to further develop their understanding for this question. There were many misconceptions here: sensors get messages from the microprocessor: sensors do a lot of processing; sensors read the music; sensors gather information; sensors do calculations; sensors only come to life when some event occurs. Most creditworthy answers listed the sensor sending signals to microprocessor, use of analogue-to-digital conversion, comparing received values with pre-stored values and microprocessor sending a signal if the speed needed to be adjusted. Full marks were rare; two marks was a more common score.

(b) Candidates needed to further develop their understanding for this question. The concept of buffering was only mentioned by very few candidates. The majority of answers were essentially a repeat of the answer to part **(a)** with some interesting solutions given: e.g. rewinding the CD or playing the music backwards. Only a handful suggested that the CD is paused until whatever caused the "skipping" ceased to be a problem.

(c) Candidates needed to further develop their answer for this question. Many candidates simply suggested here that MP3 players do not have the same problem because they do not use CDs. This is not enough to gain any marks. There needed to be some indication that MP3 players have no moving parts and/or they contain solid state memories.

Question 8

(a) This question was generally well answered.

(b) Candidates needed to further develop their understanding for this question as most candidates gained 0 or 1 mark. The most common correct answer was that "expert systems did not display any common sense". However, many candidates wrote that if the expert system was programmed wrongly or contained erroneous data then it would make an incorrect diagnosis – some candidates needed to further increase their knowledge in this area.

Question 9

(a) The majority of candidates who gained marks here made reference to the fact that the technology would use up less physical space and also consume less energy. A large number homed in on the solid state memory aspect and avoided any real reference to the advantages of a thin film being used like an LCD monitor. None of the candidates realised that it was the flexibility of the material that was the key issue as to why it was such a clever innovation. If this had been realised, it would have led to some more imaginative answers in the second part of the question.

(b) The majority of candidates referred to using the technology to make laptop screens, mobile phone screens and gaming consoles. Very few mentioned some of the real commercial advantages such as replacing large advertising boards with these screens allowing animated advertisements almost anywhere. A number of candidates also thought that it could be used in cameras and in making movies – regrettably these candidates clearly thought the thin film was similar to the film used in non-digital cameras.

Question 10

(a) Candidates needed to further develop their answers to this question. Many candidates thought they could get the mark for mentioning "modulate – demodulate" or that the modem was needed to connect to the Internet. Very few candidates made reference to the fact that an external telephone line was needed to connect to the Internet and that the modem was necessary to allow digital systems to transmit and receive data through this telephone network.

(b) Candidates needed to further develop their understanding for this question as there were many weak responses. A large number of answers like "they stop viruses" or "they stop hacking" – such answers were not sufficient to gain a mark here.

(c) The majority of candidates gained full marks for mentioning the risks of viruses and hacking when connecting to the Internet.

Question 11

(a) This question was very well answered. However, there are still candidates that confuse fields and records and completely mixed up the values in **(i)** and **(ii)**.

(b) This question was very well answered with the majority giving the output from the search condition as: M3 and M8. One or two candidates seemed to confuse AND with OR and gave an output which included M2 which unfortunately lost them the mark.

(c) A large number of candidates gave the correct search condition and gained full marks. However, many candidates lost marks here for incorrect or careless syntax. If the wording in the search condition ***does not match exactly*** with the field headings in the table then marks are lost. Also a number of candidates confused the "<" and ">" signs and a number used the AND statement rather than OR.

Question 12

(a) Candidates needed to further develop their understanding for this question. The most common errors were to miss out the first row or to fill up any gaps in the table with zeros. A sensible approach here would be to draw a line across the table each time the flowchart starts to do an "X" loop. This would have allowed easy tracing of errors if a mistake was discovered at some stage in the process.

(b) Even though a large number of candidates ended up with the wrong values in columns A to E, it was still possible to get the mark if the candidate wrote down these five values as their expected output.

(c) The majority of candidates realised that the algorithm was a *sort routine* or that it *output the values in descending order.* Unfortunately, a small number of candidates confused ascending and descending order.

(d) Many candidates correctly realised that failure to re-set the value of X to zero in the return loop would produce a never ending/infinite loop and no output would be produced.

Question 13

(a) (i) The majority of candidates tried to supply four different validation checks for each of the fields. One of the most common errors was to suggest that a length check could be made on the address field. The most sensible answers would be to suggest a *presence check* for name, *look-up check* for address, *consistency check* or *type check* for credit card and *range check* or *check digit* for card number.

(ii) A large number correctly chose type of credit/debit card and gave the reason that there were only a few possible answers. Unfortunately, one or two candidates suggested name or address would be a good choice as a drop down box since it would be easier than typing it in.

(b) This question gave a fairly mixed set of responses. Some weaker candidates just gave examples or suggested that you would shade in a box or circle.

Question 14

(a) Most candidates got the colour sequence correct but gave the wrong value for the length of time (register R2). Some candidates thought that the three values in R2 referred to each of the individual colours in R1 and suggested that the timing was: white for 1 second, green for 2 seconds and blue for 4 seconds.

(b) Overall the question was well answered. Essentially those candidates who got the timing wrong in part **(a)**, also got the value for R2 wrong here as well.

(c) Candidates needed to further develop their understanding for this question. A large number of candidates correctly suggested that colour sequence would be: red, green then blue but were unable to explain clearly why this would be the case. One or two candidates suggested that additional registers should be used – this gained full marks.

Question 15

(a) This question was very well answered but some of the drawings of the logic gates were very unclear. Candidates need to realise that Examiners have to interpret the shapes of the logic gates that are drawn – for example, if the gate drawn was a mixture of an AND gate and an OR gate (which was unfortunately fairly common) then no mark could be awarded. Also marks were lost for careless mistakes such as not drawing the NOT gate properly. Some candidates used circles with the words NOT, AND and OR inside the circles; this is acceptable at the moment.

(b) This question was very well answered. A number of candidates correctly realised that it was still possible to get full marks in this part even if they did not manage to draw a correct logic circuit in part **(a)**.

Question 16

This question was generally well answered with all marks from 0 to 5 seen. The only real common errors were putting 7 and 6 the wrong way round and 8 and 5 the wrong way round.

Question 17

The full range of marks was seen in this question. Very few candidates managed to separate the first three telephone digits correctly; however, a few string-handling answers were seen e.g. (MID(TelNo,1,3)) and a few candidates read each digit into a separate variable and then successfully tested the first 3 of these. Those using flowcharts often struggled to fit their diagram on the page and some managed to leave boxes with lines going nowhere. In general, those using pseudocode answers provided better solutions and gained more of the available marks.

COMPUTER STUDIES

Paper 7010/02

Project

General comments

The coursework projects consisted of a wide variety of suitable topics with the vast majority of Centres basing the work mainly upon the construction and operation of a relational database system.

Presentation of the A4 portfolios was often of a very high quality with many candidates routinely using common and advanced features regularly found in modern word-processing software.

Centres will need to obtain the centre-specific individual moderation report for details of both their candidates' performance and also the Centre's assessment of the projects. Moderators provide quality feedback in these reports in order that Centres can make future improvements. Many Centres acted upon last year's feedback to improve the standard of this year's coursework.

Administration

The coursework projects are internally assessed by each Centre and a sample of these projects is externally moderated. Centres must follow the process for submitting internally-assessed marks and selecting and submitting coursework samples for moderation as detailed in the *Cambridge Administrative Guide*.

The Individual Candidate Record Cards, the Summary Sheets and the MS1 mark sheet copy (or CIE Direct / CAMEO equivalent) should all be included with the coursework. These documents are required in order to ensure that results are issued on time.

The Individual Candidate Record Card should be fully completed for each candidate. It is important that the page numbers are entered correctly as this enables the Moderator to more easily locate the evidence in each candidate's coursework. The Summary Sheet should be accurately completed and the Centre is advised to keep a copy for future reference. The copy of the MS1 mark sheet (or equivalent) should be legible and list all candidates' marks. Centres should ensure that the marks have been correctly transcribed between the various documents.

The vast majority of the coursework was received by the due date. The moderation process was able to proceed smoothly where Centres met the deadline, included the correct paperwork and provided the correct sample.

Most Centres followed the instructions for providing a coursework sample and moderation was therefore able to ensure that candidates were not unfairly penalised. The sample should include the full range of marks that have been awarded by the Centre and therefore the coursework of the candidates with the highest and lowest marks should always be selected. If there is more than one teacher involved in the marking of the coursework then the sample should include approximately equal samples of the marking of each teacher. The only occasion when the entire Centre's coursework should be submitted to the Moderator is when there are 10 or fewer candidates entered in total. Additional work usually had to be requested where the sample was incorrect.

Standardising marking within Centres

Centres are required to standardise assessments across teachers and teaching groups to ensure that all candidates in the Centre have been judged against the same standards. If marks for some teaching groups have been altered to ensure consistency for the whole Centre then this should be clearly indicated to the Moderator. Centres should have rounded up any part marks before reaching each candidate's final total mark.

Choice of Task

There was a variety of well-chosen tasks which gave candidates the opportunity to score highly and achieve their potential. The quality of work was of a broadly similar standard to previous years and there was a very wide range of suitable topics presented.

The purpose of the project is to allow candidates to demonstrate their ability to undertake a complex piece of work, which is a computer-based solution to a significant problem, and to complete the solution and present their results. This project should enable the candidate to use a computer to solve a significant problem commensurate with the age and ability of the candidate, be fully documented and contain sample output for the proposed solution. Candidates had mostly been well advised to undertake tasks which were realistic rather than trying to create systems intended for large existing organisations.

Assessment

The assessment criteria are clearly stated in the syllabus. There are many Centres that understand and interpret these assessment criteria correctly and consequently award marks accurately for each section. Each section is progressive i.e. a candidate must evidence the 1 mark criterion before consideration is given to the 2 mark criterion.

The standard of assessment by Centres for each section was often accurate. On occasion, some Centres awarded a higher mark than that warranted by the work submitted. Centres should only award marks where there is clear, relevant evidence in the paper documentation. If there is no paper evidence then no marks can be awarded. Most candidates made good use of appropriate annotated screenshots and printouts to provide the necessary evidence.

Some Centres occasionally provided a framework/template for candidates to use. This can usually be considered as part of the normal teaching process, but candidates do need to complete each part of these frameworks/templates themselves. Marks can only be awarded for each candidate's own original work. Centres should also be aware that sometimes these templates can be restrictive and not allow the better candidates to provide the relevant detail often necessary for the higher marks.

Each submitted project must be the unaided work of each individual candidate.

Analysis

Section 1 **Description of the problem**

The problem definition section was well done with candidates adequately describing the background to the business or organisation as well as outlining the nature of the problem to be solved.

Section 2 **Objectives**

This is an extremely important part of the coursework as the objectives set the direction for the work as a whole. The qualitative business-related objectives and the quantitative computer-related objectives are best considered separately.

The better candidates provided detail and justifications for each of their objectives and stated each objective in relation to their own specific proposed solutions. Candidates who only provided generic objectives that could apply to any solution could not access the higher marks.

The computer-related objectives set here, are those objectives which need to be shown to have been successfully achieved in ***section 12***, tested in ***sections 14*** and ***15*** and referred to in the evaluation of ***section 18***. Therefore, it is advisable to number the objectives, as this allows easy referencing to/from the evidence.

Section 3 **Description of the existing solution**

Many candidates provided an appropriate description. Others needed to develop a more complete description containing all the details necessary for full marks as listed in the specification. For maximum marks, candidates should provide evidence of exactly how the present solution works. Many candidates included details of interviews and/or questionnaires, and would have benefited further from the inclusion of sample documents used in the present system, with explanations.

Section 4 **Evaluation of the existing solution**

Most candidates provided an evaluation. The better evaluations made explicit reference to the existing solution and often provided explanations by means of examples.

For full marks candidates need to suggest at least one realistic improvement in addition to providing advantages and disadvantages directly related to the present solution.

Section 5 **Description of other possible solutions**

Candidates often provided reasonably detailed relevant descriptions of the proposed new solution and at least one other solution.

Design

Section 6 **Action plan**

Candidates often produced some good Gantt charts to supplement their detailed tabular action plans. For the full marks to be awarded both a detailed formal action plan, including a time schedule, and a Gantt chart must be included. A basic Gantt chart alone can be awarded one mark only.

A detailed action plan should consider more than the time to be spent on each of the areas characterised in the specification – analysis, design, implementation, testing, documentation, evaluation and further development. Each of these areas should be subdivided to create more detail.

Candidates should be encouraged to consider other types of action plans, such as PERT charts, as well as Gantt charts.

Section 7 **Systems flowchart**

Many candidates achieved full marks by producing a relevant systems flowchart using the correct systems flowchart symbols.

Generic systems flowcharts and other types of flowcharts, such as program flowcharts and data flow diagrams, are not creditworthy in this section as they are not systems flowcharts.

Section 8 **Description of the method of solution**

Many candidates provided a full and detailed description of the proposed method of solution. For full marks this description must also include an explanation of at least one module of coding, such as a query or macro, to be used in a candidate's solution.

This section is about 'design'. It is in this section that candidates should be describing in detail what they are going to do. Screenshots illustrating the final solution should be placed in the Implementation section.

Section 9 **Hardware**

Lists of hardware must be relevant to the particular system being developed. In order to achieve full marks a detailed technical specification is required as well as reasons why such hardware is needed in the context of the proposed solution.

The use of hardware brand names is acceptable.

Section 10 **Software**

Candidates were usually able to list the software to be used. Software descriptions should contain reference to the actual problem to be solved and explain why certain facilities are needed within the context of the proposed solution.

The use of software brand names is acceptable.

Implementation

Section 11 **Method of solution**

This section was often completed very well with candidates usually providing comprehensive descriptions supplemented by suitably annotated screenshots and printouts.

Section 12 **Accurate method solution**

Many candidates provided evidence by listing each of the previously stated computer-related objectives together with a relevant annotated screenshot or printout. Other candidates, quite acceptably, referenced their objectives to evidence found elsewhere in their portfolios. Marks could only be awarded where evidence was provided to indicate that the objectives had been met.

Section 13 **Programming code**

Most candidates were able to gain one mark by using macros that they had created themselves. Many of these candidates then went on to gain two marks by including annotated coding for these macros. In order to achieve full marks, candidates have to code and annotate the complete solution themselves.

Testing

Section 14 **Test strategy**

Some candidates achieved very good marks on this section with test strategies clearly covering all of the previously stated computer-related objectives. A few candidates demonstrated no test strategy at all.

The test strategy must include the data to be tested together with the expected results. For full marks the strategy must be complete and also be linked to the computer-related objectives previously set.

Section 15 **Test results**

Most candidates managed to provide evidence for the testing of normal and unacceptable data. Many candidates did not provide correct evidence of testing for boundary (extreme) data because they appeared to misunderstand what constitutes boundary data. Boundary data are chosen to be at the limits of the normal range, but are still acceptable data and therefore no error message should occur.

It is not necessary to include evidence for every single test especially where tests are similar. Careful selection of screenshot evidence to provide a reasonable variety of suitable examples for different types of testing is perfectly acceptable.

Documentation

Section 16 **Technical documentation**

The better candidates produced technical documentation which would enable maintenance or modification of the system by a competent technician. An index, together with suitable descriptions, annotated screenshots and printouts, was usually provided by these candidates.

The inclusion of pages of software generated code is not suitable as technical documentation and should not be included in the project.

Section 17 **User guide**

Many candidates provided excellent user guides which were both clear and complete. These often contained full descriptions and appropriate screenshots.

System evaluation and development

Section 18 **Evaluation**

Many candidates linked their evaluation comments to the previously stated objectives and, sometimes, to their testing.

Section 19 **Developments**

Most candidates mentioned some minor, but relevant possible improvements. Some candidates listed realistic and meaningful possible developments which were subsequently justified and explained.

COMPUTER STUDIES

Paper 7010/31

Alternative to Coursework

General comments

This paper provided an alternative to submitting coursework. The candidates were advised to spend at least 20 minutes reading the information about the existing system and the proposed web-based system. It is really important that the candidates carefully studied the information provided at the start of the paper, since answers to all parts of the single compulsory question on this paper required reference to the web-based Holiday Villa Rental system described.

Candidates who did not use the information provided at the start about web-based Holiday Villa Rental system described at the start of the paper could not obtain full marks for their answers.

Comments on Specific Questions

Question 1

(a) Most candidates supplied at least one correct reason for choosing to use project management software to produce a PERT chart to check to progress of the project.

(b) (i) Most candidates identified questionnaires as an appropriate method of fact finding from the people who rented the villas, with better candidates explaining why the analyst would have chosen this method.

(ii) Most candidates correctly identified a method that would have been inappropriate for this group of people. The best answers explained why the method was inappropriate in this case. For example, 'Observation was not a suitable choice because many people used the telephone from their own home to rent the villa so it would be both difficult and time consuming to arrange these observations in different locations.' would have been a suitable answer.

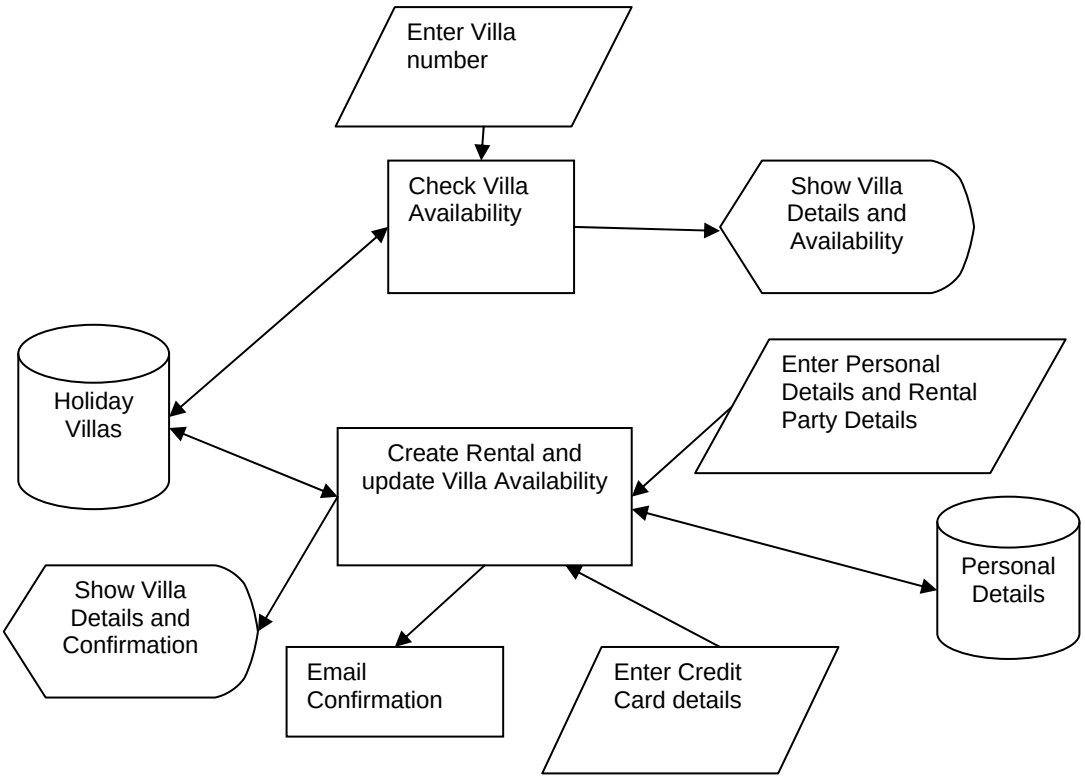
(c) Many good screen designs showed the use of dropdown boxes for the number of people and the number of children. Better candidates made use of a calendar for the choice of dates.

(d) Better candidates identified that an email address was required.

(e) (i) Most candidates could correctly identify three or four flowchart symbols that they intended to use in their system flowchart.

(ii) Better candidates provided good responses for this part of the question that showed a clear understanding of how the proposed system could work. Candidates need to take care to include only processes, data stores, inputs and outputs that relate to the system described at the start of this examination paper.

There were many ways of drawing a systems flowchart for the Holiday Villa Rental system; the example below would have gained full marks.



(f) Many candidates were able to identify some steps the analyst had to take in order to secure the payments taken over the Internet.

(g) (i) The best candidates provided a good explanation of why the systems analyst would choose to employ a programmer to write bespoke software for the new web-based Holiday Villa Rental system. Weaker answers were not written in the context of the Holiday Villa Rental system.

(ii) Most candidates gave at least one drawback to making this choice.

(h) Some excellent responses were seen containing specific examples of test data that could have been used, for the number of children, giving detailed reasons for choosing that data. Other candidates needed to be more specific in their answers as the question asked for examples of data that could be used to test the number of children, so examples of other test data were not creditworthy.

(i) Most candidates attempted to write an algorithm to check the number of children. More flowcharts than pseudocode were seen.

(j) Most candidates gave at least one advantage; the most popular correct advantage was the improved availability of the web-based system.

(k) The majority of candidates identified at least one method of evaluation; better answers clearly described two ways in which the new system could be evaluated.

COMPUTER STUDIES

Paper 7010/32

Alternative to Coursework

General comments

This paper provided an alternative to submitting coursework. The candidates were advised to spend at least 20 minutes reading the information about the existing system and the proposed web-based system. It is really important that the candidates carefully studied the information provided at the start of the paper, since answers to all parts of the single compulsory question on this paper required reference to the web-based Cruise Booking system described.

Candidates who did not use the information provided at the start about the web-based Cruise Booking system described at the start of the paper could not obtain full marks for their answers.

Comments on Specific Questions

Question 1

(a) Most candidates supplied at least two correct reasons for choosing to use project management software to produce a Gantt chart to check to progress of the project.

(b) Candidates who explained why questionnaires were a suitable method of fact finding to use for people booking a cruise generally gained one or two of the two marks available. The responses that described the use of questionnaires or advantages for other groups were not creditworthy.

An alternative method was usually correctly identified.

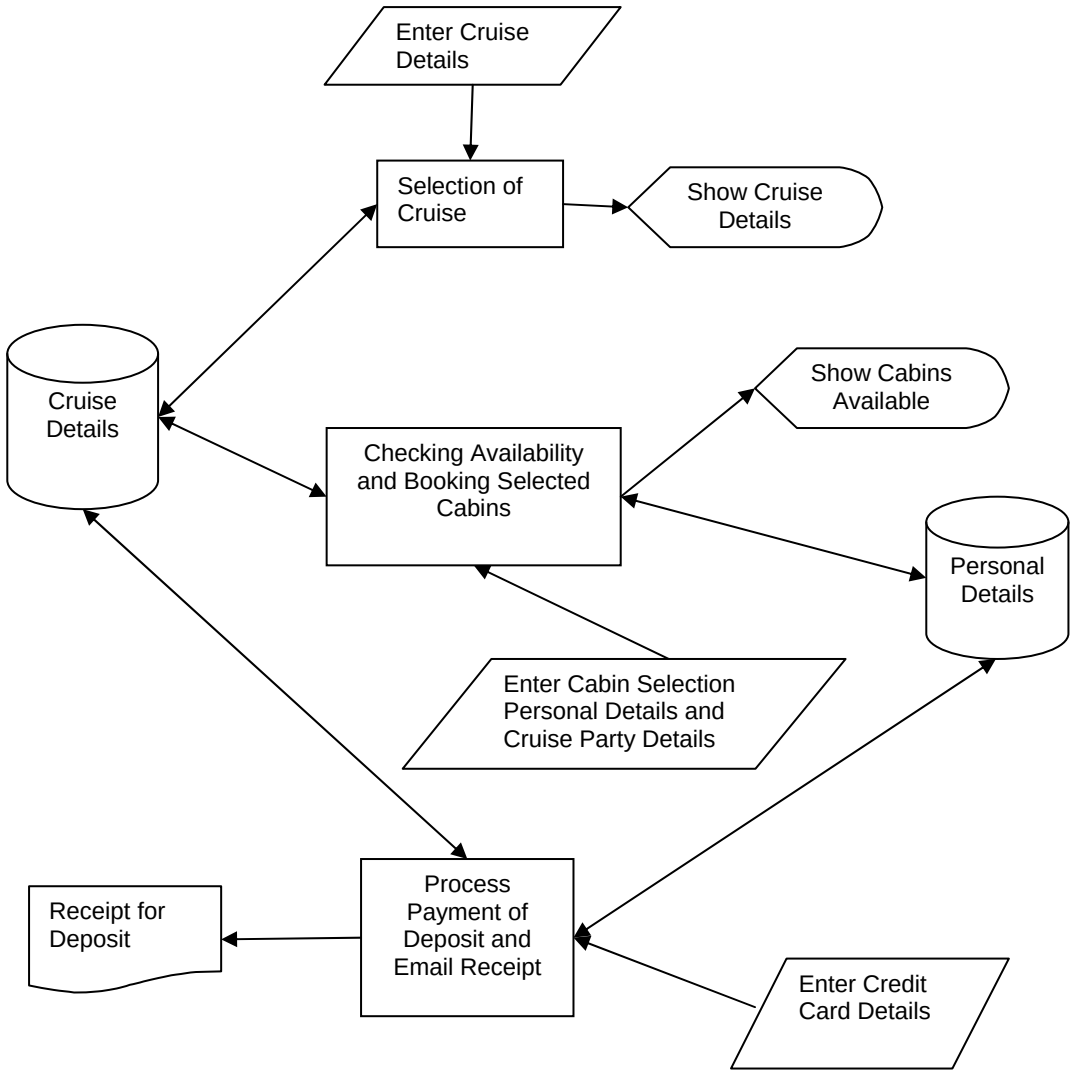
(c) Most candidates correctly identified one or two items of hardware that someone may need to book a cruise online, better candidates justified their choice(s) in the context of using the web-based Cruise Booking system. Candidates need to answer the question set; those who had prepared an answer for a different question rather than the one on the paper could gain little credit.

(d) Better candidates correctly identified the generic features that should be found on a website and then applied the reasons to the web-based Cruise Booking system. These candidates included features such as a site map, contact details, FAQs, and a search facility.

(e) Most candidates could draw three of the four flowchart symbols asked for. The merge symbol was the least well known.

(f) Better candidates provided excellent responses for this part of the question that showed a clear understanding of how the proposed system could work. Candidates need to take care to only include processes, data stores, inputs and outputs that are included in the web-based Cruise Booking system described at the start of this examination paper.

There were many ways of drawing a systems flowchart for the web-based Cruise Booking system; the example below would have gained full marks.



(g) Most candidates attempted to write an algorithm to check the names of the children. More flowcharts than pseudocode were seen.

(h) Most candidates were able to identify some steps the analyst would take in order to ensure that the data collected when a cruise is booked is kept secure.

(i) There were some excellent responses for this question with candidates showing good understanding of the strategy required for testing. Candidates who only considered one aspect of testing, for example, choice of test data were unable to gain full marks for their answers.

(j) Candidates needed to identify two sets of test data that could be used to test the booking system. Those candidates who successfully answered this part of the question gave specific examples of data as specified in the details always required part of the web-based Cruise Booking system and then explained their choice in terms of how it would test this system.

(k) The identification of methods of implementation was completed well by nearly all candidates. Most candidates could explain in general terms which method would be suitable. The best candidates gained good marks by explaining their choice in the context of the web-based Cruise Booking system.