COMPUTER STUDIES

Paper 7010/11

Paper 11

General comments

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However, some of the more up-to-date topics, such as the use of satellite navigation systems, caused considerable problems for many of the candidates. Candidates need to be kept fully aware of changes in computing applications which are taking place all around them at a rapid pace. However, some of the older topics, such as Expert Systems, continue to give problems to many candidates.

Comments on specific questions

Question 1

(a) This question was not well answered with the majority of candidates not being awarded any marks. The main points which gained marks were reference to validation checks and examples such as bar codes and ISBN codes.

(b) Many candidates gained full marks here usually for a correct definition and description, such as volatile/temporary memory.

(c) This was a new question and the term was not very well understood by the majority of candidates with very few gaining any marks. A significant number made no attempt at all. Good examples of *macros* are single key strokes replacing a number of instructions.

(d) This was generally satisfactory with many candidates gaining full marks for a *portable, storage device.*

(e) Again, generally satisfactory with many candidates gaining marks for *temporary store/memory* and *used to compensate for the difference in operation speed of the printer and CPU.* Although many candidates tried to make the second point, their answers were too vague or inaccurate.

Question 2

(a) The majority of candidates gained one or two marks here for reference to viruses and to the effects of power loss to the computer. Many vague answers were supplied, such as "software not working properly" or "hardware not working" were much in evidence. Further expansion on such answers is needed to gain any marks e.g. *software clashes occurred, overheating circuit boards/processor fan failure, etc.*

(b) This was generally well answered by the majority of candidates.

(c) Again, this was well answered. Many candidates now appear to understand the difference between encryption and coding.

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(b) Most candidates correctly referred to the sharing of files and hardware resources as one of the main advantages of networking computers ….

(c) …. however, very few gave a valid reason for not using networks e.g. more rapid transfer of viruses across the network of computers, or infrastructure costs such as cabling.

Question 4

(a) There were very few problems here with most candidates gaining full marks. Several attempted to write the full name of each item rather than just the item number. No marks were deducted for this, it simply saves the candidates valuable time and makes it easier.

(b) Only half the number of candidates realised this was a verification procedure. The most common error was to call it a "double entry" method which it was not. Whilst *double entry* is a verification method, the algorithm was matching a *user id* with a *password.*

Question 5

(a) Many general descriptions were given here which ignored the scenario in the question which was looking for differences between *real time transactions* and *real time process control*. The former could be an online booking system for theatre performances, where all the individual transactions are processed as they occur (thus preventing double booking, for example). The second one could be controlling the temperature in an air-conditioning system using sensors (and other hardware) where values could be compared against pre-set values. Many answers which attempted to describe how these two applications worked were very vague and gained few, if any, marks.

(b) Fairly well answered with about two thirds of the candidates getting at least one of the tasks carried out by a typical operating system.

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(a) Many candidates realised that the main advantage was reduced costs due to a reduction in printing and distribution of the paper directories.

(b) Many candidates realised that the electronic option was faster/easier to locate telephone information. But a number made the statement: "you can do it any time" – which is true of both systems in reality so could not be regarded as an advantage of an electronic system.

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Question 7

(a) This was fairly well answered with many correct responses, such as *questionnaires* and *interviews,* in part **(i)** and suitable implementation methods, such as *parallel* and *direct*, in part **(ii)**. However, many lost the second mark in part **(ii)** by giving very poor or vague reasons why the named method was chosen.

(b) This question was not very well answered with few candidates realising that the question referred to the arrivals board and gave answers such as "names of the passengers", "what hotels were available nearby", etc. The possible answers being looked for were: *current time*, *terminal number/ name, baggage claim area/carousel number, etc.*

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(a) The majority of candidates gave correct examples of video conferencing hardware (such as webcams, microphones, etc.). However, very few got the mark for software, with general statements made, such as "video conferencing software", "webcam installation software", etc., or the software named was incorrect, such as VoIP (e.g. skype).

(b) Most candidates gained one mark here for mentioning potential time zone issues. Many vague statements, such as "loss of electricity supply" or "bad Internet" were mentioned by the candidates.

(c) It was clear that very few candidates read the question carefully here: "*Apart from travelling and accommodation costs ……"* since many answers referred to saving costs. The question was looking for *saving travelling time, meetings can be called with short notice* (NOT *can be held at any time* which many candidates claimed – these are not the same point)

Question 9

This was reasonably well answered with many of the errors in the algorithm being correctly spotted by the candidates. Less successful were the reasons why these were errors and how they could be corrected. But it was nonetheless encouraging to see better answers here than in previous years.

Question 10

(a) Most candidates correctly identified that there were SIX fields in each record. The only common mistake was to choose ELEVEN – this was the number of records in the database section shown.

(b) Again, most candidates answered this correctly. Most errors were omissions or misunderstanding of the < (less than) or > (greater than) signs which lead to incorrect responses being given.

(c) This question was well answered. The most common errors were the use of AND instead of OR and inserting units after the numerical values 74 and 900. Those who confused < and > signs in part **(b)** frequently made the same mistake in this part.

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(a) The majority of candidates gained marks here for *counting vehicles* but nothing else. A small number went on to mention *collecting data at different times of the day, take into account heavy traffic, etc.*

(b) This question was not well answered with many vague answers such as "it is cheaper", "it is faster", "it is safer" etc. without any qualification whatsoever. Consequently, no marks could be awarded.

(c) Many candidates gained marks here for the role of the sensors. Better candidates went on to discuss the use of ADC/DAC and how the computer controls the traffic lights. Unfortunately, many said "sensors collect the information" but did not say WHAT information and lost the marks.

Question 12

(a) (b) Many marks were lost here for avoidable mistakes such as brackets in the wrong place, e.g. SUM(B2:M2/12) or (L5 – L4 * L3), missing "=" sign in formulas or use of an × instead of *. These were all careless and avoidable mistakes.

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The question was asking for the stages in developing an Expert System such as *gather information from experts, create a knowledge base, create a rules base, create an inference engine, etc.* This was surprisingly badly answered with the majority of candidates gaining no marks at all.

Question 14

(a) This question did not cause too many problems. However, marks were lost for the *amend* part where some very vague answers were given e.g. "incorrect information needs changing" – what information?

(b) In part **(i)**, the biggest error was to say that coding is used for security purposes or that it saves space. The first is a clear indication of confusing coding with encryption; the second answer is just too vague – saving space where? *AGE* was correctly chosen by many in part **(ii)**, but many went off track and gave an improved field that had nothing to do with *age* e.g. "use an id number".

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(a) Three different validation checks were needed here. Many marks were lost for examples of each field being given instead e.g. "candidate sex – type in M or F", "date – type in 15/12/2010" or "exam result – type in 55". None of these types of response answered the question since a description or name of suitable validation checks was required.

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(a) This was a new question this year, although the topic has been on the syllabus for a number of years. In spite of a diagram to help the candidates, many still suggested signals were sent FROM the satnav TO the satellites. Several candidates also had sensors sending signals to the satellites, etc. In general, how GPS works was alien to the majority of candidates with only one or two gaining up to 2 marks. Satellites transmit signals TO the satnav, which uses the received signals together with stored maps to help navigate; the satellites use very accurate (atomic clocks) to enable accurate timing to be used. At least three satellites are used to determine the vehicle position.

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COMPUTER STUDIES

Paper 7010/12

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COMPUTER STUDIES

Paper 7010/13

Paper 13

General comments

Overall the paper elicited a wide range of marks. None of the questions set denied candidates the opportunity to display their knowledge. There were a few questions, detailed below, where some candidates had difficulty in achieving the maximum marks on offer. The comments below on individual questions provide a rationale on the awarding of marks which should prove helpful to teachers of the subject. Examples are given of responses which did obtain marks when a degree of interpretation had to be made when considered alongside the specific wording of correct responses in the mark scheme; and, equally, examples of responses which did not obtain credit. It was pleasing to note that, apart from **Question 2b**, very few candidates made the mistake of giving trade names as opposed to generic terms when answering the questions. In those questions where a specific number of responses were asked for, again very few candidates gave a long list of answers in the hope that there would be a correct response the Examiner would find and give credit for. Good answers were given by those candidates who carefully read the questions before attempting an answer.

Comments on specific questions

Question 1

As a whole **Question 1** was answered well by most candidates with very few candidates not achieving at least 6 marks.

Question 1

(a) This was answered well with many candidates obtaining the maximum 2 marks. The most popular correct answers were that 'an interrupt is a signal sent ***from*** a device causing a break in a program'. The most frequent correct example was that of the printer out of paper/ink. A number of responses seen, which did not gain marks, was that the computer sent the signal ***to*** the device.

(b) Not well answered. Marks awarded were almost exclusively for examples of optical media – CDs and DVDs. Very few candidates gained marks for giving any of the other marking points.

(c) Candidates scored well on this part – commonly for stating correctly that CAD stands for Computer Aided Design. A good spread of the other marking points were given by candidates.

(d) Mainly well answered but still a few candidates confused verification with validation. Marks were awarded for a wide spread of the marking points.

(e) Not well answered. Marks in the main were awarded for mentioning the use of satellites. A commonly seen error was the assumption that GPS actually tracked the vehicle and could report on its location to a third party.

Question 2

(a) Fairly well answered by many candidates. Errors made included repeating the question – 'a drop-down menu is a menu which drops down when clicked' and 'a drop-down menu breaks a problem down into smaller and smaller parts'.

(b) Many candidates' examples were far too vague – 'in a word-processor'; 'in windows' etc. A significant number used trade names, which can never be awarded credit – '(drop-down menus) are used in Word/Excel'.

(c) Again well answered by most candidates. The most commonly seen responses being '(a drop-down menu) has limited choices/selections/options'.

Question 3

Not a well answered question. Many candidates just described the ***components,*** not spotting that the question asked for a description of the ***function*** of the components. So for example '(RAM) is a temporary memory where it can be read and written' gained no credit, whereas 'ROM contains the BIOS' is a function of ROM and so did gain credit. Most marks scored for the question as a whole were awarded for the function of a modem (possibly because a description of a modem almost necessarily describes also its function) - for example '(a modem) modulates and demodulates signals'; '(modems) are used to connect to the Internet'.

Question 4

(a) Most candidates scored marks for describing batch processing correctly. Many candidates described real-time processing as opposed to real-time ***transaction*** processing.

(b) Correct batch processing examples were common but fewer correct real-time transaction processing examples were seen. 'Automatic pilots in aeroplanes' being a frequently seen incorrect response whereas '***online*** booking systems' and '***online***/Internet banking' are prime, correct examples.

Question 5

(a) Many candidates appeared not to spot that the question asked specifically for features to be looked for when choosing ***a laptop***. Features, therefore, such as processor speed, hard disk capacity, in-built network card etc. failed to gain credit as they did not address the particular features looked for when choosing a ***laptop***.

(b) A wide range of correct responses were seen for this question. Errors commonly seen were vague responses such as 'the connection speed is faster with broadband', 'broadband is fast to connect but with dial-up you need to dial first'. As broadband is always on, 'connection' is not an issue. However, 'The download/transfer speed is faster using broadband because of the greater bandwidth used' would gain 2 marks for describing in detail one of the advantages of using broadband. A number of candidates were given credit for saying that 'dial-up occupied the phone-line so calls could not be made', but it is worth reporting that unless a comparison is made with, and highlights the *advantage of broadband*, strictly speaking this response does not answer the question.

Question 6

This was usually well answered for the last two applications but less well for the first application. 'Bar code reader', 'magnetic character reader/recognition', 'magnetic ink reader/recognition' were commonly seen incorrect responses.

Question 7

The most commonly seen responses from the four methods given on the mark scheme were 'direct' and 'parallel', with fewer 'phased' and very few 'pilot'. Many candidates were then able to go on and give correct advantages and disadvantages to their given methods. A well answered question.

Question 8

This was very poorly answered. Few candidates scored more than a single mark, usually for mentioning rendering and/or tweening. Most responses were very general and displayed a lack of in-depth understanding of the processes involved. Many candidates thought that CAD would be used; others that simulations would be used. For example, 'graphics would be created on the computer using CAD and then the computer would animate these graphics' did not gain credit.

Question 9

(a) and (b) Candidates did not usually score highly on either part **a** or **b** in this question. Commonly seen correct responses mentioned that the paper-based newsletter could be read at any time and be referred to again and again. Such continuous referencing would not be possible with the multimedia presentation. Cost of ***specific*** printing materials was also awarded credit but to merely state that 'printing costs would be high' was insufficient to gain credit as it fails to recognise the high costs of the multi-media presentation. A response seen frequently but which did not gain credit was related to the cost and/or disruption to ***parents*** getting to the presentation. The advantages and disadvantages were to the school – so 'parents may not turn up to the presentation' is a clear disadvantage to the school if they were to put on the multimedia presentation and so could be awarded credit, but 'it might cost a lot for parents to get to the school for the presentation' could not be awarded credit.

Question 10

(a) Very well answered with most candidates scoring the full 2 marks on offer.

(b) Less well answered. It appears as though some candidates still assume that 'coding' is synonymous with encryption. 'M' and 'F' to represent 'Male' and 'Female', respectively, is an example of coding. '£2!&*6k#~:' could be an example of encryption providing this example could then be decrypted with the use of a decryption key to allow it to become once more understandable.

(c) (i) Fairly well answered.

(ii) Again a fairly well answered question. A commonly seen response not given credit was that 'encryption' ***prevented*** unauthorised access whereas it merely prevents understanding of the material **once accessed**.

Question 11

(a) (i) Well answered.

(ii) Poorly answered – few candidates gave a correct response.

(iii) Many candidates recognised this as an example of a presence check.

(b) Many candidates responded with a different validation check but fewer could then go on and give a correct example of how it works. For example: 'if x>'******'' is not a correct example of a length check; 'name='abcdefg'' is not a correct example of a character check. Some candidates gave a correct example of a validation check but unfortunately not the validation check they had named.

Question 12

(a) Well answered.

(b) Poorly answered. Many candidates gave vague responses which could not be awarded the mark – 'a huge amount of information is available'; 'many different types of information can be found on the Internet' etc. Some form of comparison is needed to highlight the advantages of using the Internet – '**more** information can be found on the Internet'; 'it is quicker finding information on the Internet **than** having to travel to the library to fetch books' etc.

(c) Much better answered – many candidates recognised the unreliability of information obtained from the Internet and the risk of downloading viruses.

Question 13

(a) Well answered. Common errors in the responses to this question were the use of a cross (X) instead of an asterisk (*) in the formula (which would be necessary for the formula to work). An interesting (correct) alternative to that on the mark scheme given by a number of candidates was '=(C2*2)+(D2*15)/100'.

(b) Less well answered – a common incorrect response seen used the function '**MIN**(E2:E6)' instead of the correct '**MAX**(E2:E6)'.

(c) Poorly answered. Most marks were given for 'adding another column'. Few candidates then went on to give a correct new or altered formula to establish the best deal.

Question 14

(a) and (b) Both parts were very well answered by almost all candidates.

(c) Less well answered. A commonly seen incorrect response was to miss the **'AND'** (which gives the correct number of 4 records) and treat the search condition as an **'OR'** (which results in only 2 records being found).

(d) Well answered. Candidates need to be made aware that the omission of the (km) and ($) in the search condition, or the inclusion of these but in the wrong place – (Distance from airport<10(km)) etc. will render the search condition unworkable.

(e) Well answered by most candidates. Candidates need to be made aware of the difference between **ascending** and **descending** order.

Question 15

(a) Well answered by most candidates. Most incorrect responses seen were in the bottom half of the flowchart.

(b) Candidates usually appeared to understand why the signal needed converting, but often merely repeated the question and said the signal needed changing from analogue to digital without explaining why – because the sensor produces analogue signals and the computer/alarm system only 'understands' digital signals.

(c) Many candidates could give another type of sensor but then found it difficult to describe an **application** which used it. Most often a description of the sensor was given – i.e. 'a temperature sensor measures if the temperature is high or low' – which is not an application. Commonly seen incorrect types given were – 'heat sensor', 'traffic sensor', and 'water level sensor'; these were not given credit.

(d) Generally well answered but with a large variety of incorrect responses given – 'microprocessor', 'sensor' etc.

Question 16

(a) (i) and (ii) Both parts well answered.

(iii) Not as well answered. A great number of ***alternative*** codes were suggested but fewer ***improvements*** to the coding system given.

(b) (i) and (ii) Both parts well answered.

(c) Well answered by most candidates.

Question 17

(a) Few candidates scored more than 2 marks on this part of the question, mainly for establishing the largest number input and calculating the average and then printing both required outputs. Most candidates succeeded in initialising the variables but need to learn that variables are not always initialised to zero. In this question initialising the variable used to hold the value of the highest number to zero is an inappropriate value (a large **negative** value would ensure that whatever the first number input, assigning that number to the 'highest' variable would give the desired correct result). Very few candidates realised that any loop involved would be terminated by the input of the rogue value -1. Many believed that the loop would be terminated when a number which ***ended*** in -1 was input.

(b) Fewer candidates scored well on this part. Most marks were awarded for initialising the number of digits to 0 (in this instance a correct initialisation value). Very few candidates assigned the number input to an alternative variable thus allowing the original number to be retained for later output. A significant number of candidates utilised a series of IF...Then...Else statements to count the number of digits but then did not recognise that the initial number ***might*** contain any number of digits. Stopping counting the number of digits after 3 or 4 IF…Then...Else statements *could* result in an incorrect output and so was not given credit. However, credit was given where the candidate gave some indication that the IF...Then…Else statements would continue until the *total* number of digits was counted.

COMPUTER STUDIES

Paper 7010/02

Project

The quality of work was of a broadly similar standard to previous years. Administration by the Centres was generally good. It would be beneficial if Centres could put the **Individual Candidate Record Card** for each candidate, whose work is sent for moderation, loosely inside the front cover of the work and indicate on the **Coursework Assessment Summary Form** which candidates were in the sample.

Overall the standard of assessment by Centres is reasonably accurate but not as accurate as in previous years. However there are some occasions where credit appears to have been awarded when there is no relevant work in the documentation. There are also occasions where a higher mark has been awarded than that warranted by the work. The largest area of discrepancy is concerned with the hardware, software and objectives - together with the links with later sections. It would be useful if these objectives were numbered in some way so that it becomes easier to refer back to these in the later sections.

It is important to realise that the project should enable the candidate to use a computer to solve a significant problem, be fully documented and contain substantial sample output from their proposed system. Some candidates are attempting inappropriate projects of an impossible magnitude; e.g. a new database for a multi-national bank, a new website for a university. Some projects do not demonstrate that they have actually been run on a computer. Software advances and the use of 'cut and paste' can give the impression that the results have simply been word-processed. It is recommended that candidates make use of appropriate screen dumps and include these in their documentation to show the use of a computer as well as candidates including the actual reports printed from their system. Candidates often referred to the system life cycle in parts of their documentation, plans and enhancements; this is not what is required in these sections, and any links should be made with reference to the objectives in **Curriculum Content Section 2** of the syllabus.

However the standard of presentation and the structure of the documentation continue to improve. Many candidates structure their documentation around the broad headings of the assessment scheme, and this is to be commended. It would appear that many schools provide their candidates with a framework for documentation. This can be considered part of the normal teaching process but the candidates do need to complete each of the sections **in their own words**. Each project must be the original work of the candidate.

Centres should note that the project work should contain an individual mark sheet for every candidate and one or more summary mark sheets, depending on the size of entry. It is recommended that the Centre retain a copy of the summary marksheet(s) in case this is required by the Moderator. It was pleasing to note that the vast majority of the coursework was received by the due date. It causes some considerable problems in the moderation process where Centres fail to meet this deadline. Although the syllabus states that disks should not be sent with the projects, it is advisable for Centres to make backup copies of the documentation and retain such copies until after the results query deadlines. Although disks or CDs should not be submitted with the coursework, the Moderators reserve the right to send for the electronic version. Centres should note that on occasions coursework may be retained for archival purposes.

Areas of relative weakness in candidates' documentation continue to include setting objectives, hardware, software and testing - particularly the lack of specific test data which is to be used together with the expected results. Without these expected results no marks can be awarded for test strategy. This strategy must also be a completely separate section from the actual test results and be documented before the results have been produced.

The mark a candidate can achieve is often linked to the problem definition. The candidates need to describe in detail the problem and where this is done correctly it enables the candidate to score highly on many other sections. If the objectives are clearly stated in computer terms then a testing strategy and the subsequent evaluation should follow on naturally, e.g. print a membership list, perform certain calculations etc.

Description and/or evaluation of the existing system were misinterpreted by some candidates and they described/evaluated a system which was not the existing system. Credit can only be given in these ***sections (3 and 4)*** for the current existing system. The method of solution must be explained in order to gain credit in ***section 11***. It is not sufficient to produce some output and expect to score marks in the testing sections. Candidates must also ensure that data used during testing is compatible with the two years prior to the examination, i.e. the last two years of their secondary schooling. Any dates outside of this timescale suggest that the project may not be the candidate's own work and therefore will be investigated further for malpractice. The number of cases of suspected malpractice has unfortunately increased over the last year and Moderators have become very aware of the various techniques which candidates may use in this respect. In a number of instances it is the teachers themselves who have brought this to our attention and Examiners are most grateful for the professional manner in which they carry out their assessment duties.

There was evidence that some candidates appeared to be using a textbook, or the teacher's notes, to describe certain aspects of the documentation, especially the hardware section. Some candidates did not attempt to write this section of the documentation with specific reference to their own problem. It is important to note that candidates write their own documentation to reflect the individuality of their problem and that group projects are not allowed. Where the work of many candidates from the same Centre is identical in one or more sections then the marks for these sections will be reduced to zero by the Moderators. Centres are reminded of the fact that they should supervise each candidate's work and verify that the project is the candidate's own work.

Centres should note that the **new specification** will be examined from 2011 bringing with it the option of an 'Alternative to Coursework' paper. There will also be a number of **changes to the scheme of assessment for the project** for those Centres deciding to offer the coursework option. Please refer to the syllabus for 2011.