Candidates' Performance

Paper 1A

This section consisted of 40 multiple-choice questions. Candidates' performance was generally satisfactory with an average of 27 questions answered correctly. They performed better in 'Internet and its Applications' and worse in 'Computer System Fundamentals.' Post-examination item analysis revealed the following:

1. Question 2 tests two's complement representation. Only about half of the candidates answered correctly. Candidates were weak in data representation, which is essential for understanding the mechanism of the data operations in a computer.

Q.2 Which of the following decimal values is equivalent to 1010 0001 in 8-bit two's complement representation?

A. 33 (9%)
B. -33 (15%)
C. 95 (23%)
* D. -95 (53%)

2. Question 8 tests candidates' knowledge of document formats. A third of the candidates were not aware that both PDF and DOC files can include multimedia elements. A quarter of the candidates thought that DOC files could not be encrypted. It seems that candidates did not thoroughly understand the use of PDF and DOC files, nor could they justify their usage. They demonstrated a basic understanding of document formats.

Q.8 Mary sends an email with a document in PDF instead of DOC format. What is/are the possible reason(s) for this?

(1) The document can be encrypted.
(2) The page layout of the document can be preserved.
(3) Multimedia elements can be included.

A. (1) only (13%)
* B. (2) only (41%)
C. (1) and (3) only (13%)
D. (2) and (3) only (33%)

3. Question 9 tests candidates' ability to integrate knowledge of office automation software. From the response figures, it seems that weaker candidates thought that a pivot table in spreadsheet was a tool for designing and producing result slips. They probably lacked practical experience in using pivot tables and creating reports in database software.

Q.9 Ms Li plans to design and produce student result slips using student information and examination marks stored in a database. What should she do?

* A. Create reports using database software. (39%)
B. Create hyperlinks to the database using word processing software. (8%)
C. Create SQL commands using spreadsheet software. (13%)
D. Import data and create a pivot table using spreadsheet software. (40%)

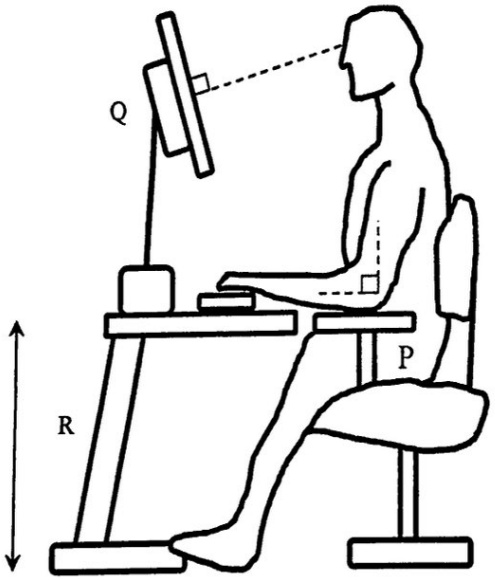
4. In Question 22, only a third of the candidates demonstrated comprehensive knowledge and understanding of basic machine organisation. They integrated the knowledge of the structures and functions of a CPU, registers and data buses.

Q.22 Which of the following statements about the components in a computer is not correct?

A. The arithmetic and logic unit (ALU) is used to perform arithmetic operations. (5%)
B. The accumulator is a register that stores arithmetic and logic results. (21%)
C. The data transfer rate of registers is higher than that of the main memory. (41%)
* D. Data buses are used to transfer control signals between the main board and input/output devices. (33%)

5. In Question 40, the majority of candidates wrongly thought that the angle of the armrest should be adjustable. Good ergonomic practices for armrests include adjustable height and adequate width and length, but not an adjustable angle, which can be easily found in our daily life. Candidates should observe the ICT applications around them and strengthen their understanding of ICT knowledge.

Q.40 The picture below illustrates good ergonomic practices for using a computer.



Which of the following settings are necessary?

(1) The angle of the armrest at P should be adjustable.
(2) The angle of the display unit at Q should be adjustable.
(3) The height of the table at R should be adjustable.

A. (1) and (2) only (13%)
B. (1) and (3) only (3%)
* C. (2) and (3) only (26%)
D. (1), (2) and (3) (58%)

Question Number		Performance in General
1	(a)	Good. A high proportion of candidates correctly described a validation check. However, some candidates wrongly thought that 'range check' was a correct answer.
	(b)	Good. A high proportion of candidates gave the correct output for the SQL statement.
	(c)	Satisfactory. About half of the candidates correctly stated the disadvantage of storing 'ABS' or '0' in TEST1 and TEST2 to represent absence. Some candidates stated that the use of '0' would lower the average mark of the students. However, such an arrangement was an administrative consideration after the data preparation. The computation result regarding the average mark was unrelated to the issue raised during the data preparation required in the question. In (c)(ii), candidates correctly stated the need to identify and discard -1 as a precaution in data processing.
	(d)	Fair. About half of the candidates gave the correct value stored in `E101`. However, a high proportion gave wrong cell addresses in the formula in (d)(ii). Their understanding of the related concepts seems to be weak.
2	(a)	Satisfactory. While about half of the candidates answered correctly, some wrongly answered that system software was pre-installed in the computer whereas application software needed to be downloaded. In fact, application software could also be pre-installed in the computer, depending on the arrangement of related manufacturers. Some other candidates scored no marks as they just listed the characteristics of system software without any comparison with the application software. Weaker candidates overlooked the differences required in the question.
	(b)	Satisfactory.
	(c)	Satisfactory. Weaker candidates failed to give correct contents of `A` and `B` in (c)(i) though they did give the correct answer in (b). The ability to trace algorithms seems to be weak. Furthermore, they gave wrong answers in (c)(ii), showing that their understanding of algorithm design was very limited.
	(d)	Satisfactory.
	(e)	Satisfactory. The majority of candidates wrote the assignment statement to set `A`, but failed to write the correct statement to set `B`. It seems that they were weak in modifying algorithms.
3	(a)	Satisfactory. Weaker candidates wrongly used 1,000 instead of 1,024 to calculate the storage capacity in GB unit. In (a)(iii), just under half of the candidates explained the concept of data packets and the use of IP addressing. In (a)(iv), weaker candidates wrongly stated network speed, instead of network bandwidth, as a technical issue related to streaming.
	(b)	Good. Stronger candidates explained the importance of brightness to be provided or controlled by the new lighting system and curtains. However, only a small number of candidates mentioned the potential issue of the glare on the display unit.
	(c)	Good. Weaker candidates gave some vague answers such as 'eye' as another biometric authentication in (c)(i) which was too general and could not be awarded any marks. The existing technology relates to the iris, not the eye.

4	(a)	Fair. Weaker candidates wrongly answered 'router' as the connecting device in (a)(i). In (a)(ii), they wrongly thought that a function provided by the dedicated terminal, such as displaying ordered food, was a network service provided by the server.
	(b)	Satisfactory. In (b)(i), the buttons on the sample screen allowed users to input whole numbers one by one, which could help minimise input errors, but users might still make errors by ordering the wrong number of food items. Weaker candidates did not understand this concept.
	(c)	Satisfactory. The majority of candidates gave one reason to support the use of thermal printers in self-service kiosks.
	(d)	Satisfactory. In (d)(i), the majority of candidates correctly stated that less manpower would be needed on the dedicated terminals, but they ignored the task generated by maintaining the self-service kiosks. Their understanding of the concept of the change in the nature of work seems to be weak.
5	(a)	Good.
	(b)	Satisfactory. In (b)(ii), weaker candidates wrongly gave 1 as the first bit in the bit pattern due to the first column of the first row being a black pixel. In (b)(iii), almost all incorrect answers were 128, showing that weaker candidates did not fully understand the data representation of the display.
	(c)	Fair. In (c)(ii), as there were no repeated, identical rows in the display, it was not necessary to take care of the number of occurrences of the row of pixels in the bit patterns. Hence, Method 2 was identical to Method 1 in the display of the pixels. Weaker candidates attempted to handle the issue regarding repeated rows, resulting in a wrong conclusion.

Paper 2A

Question Number		Performance in General
1	(a)	Poor. Only a small number of candidates identified the attributes (MID+VID+RDATE) as the primary key in the database table. Many candidates did not know the RDATE attribute.
	(b)	Good. Weaker candidates did not use single or double quotes in a string constant.
	(c)	Satisfactory. Weaker candidates wrongly used COUNT instead of SUM.
	(d)	Good. The majority of candidates used LEFT OUTER JOIN to provide the correct solution.
	(e)	Satisfactory. Weaker candidates did not use YEAR properly. They also wrongly provided an UPDATE statement.
	(f)	Very good. Nearly all candidates gave the purpose of the SQL statement.
2	(a)	Good. About two thirds of candidates identified the two problems and provided corresponding solutions. Weaker candidates did not provide a solution to the problem of duplicated identity codes in the two database tables.
	(b)	Good. A high proportion of candidates completed the ER diagram. Weaker candidates wrongly stated the minimum cardinalities in the two relationships.
	(c)	Good. About two thirds of candidates described how data mining techniques improve the company business. However, some candidates did not identify appropriate data items in the order form.
	(d)	Good. Weaker candidates provided a design without proper multiple search functions. Some of them missed the date range in the design.
3	(a)	Good. Nearly all candidates completed the CREATE TABLE statement. A small number of them omitted the constraint of the SID attribute.
	(b)	Satisfactory.
	(c)	Good. A high proportion of candidates identified the two problems during the failure of execution of the SQL statement. Only a small number identified the problem of the null value of the NAME attribute.
	(d)	Satisfactory. A high proportion of candidates identified the primary key among the data items in the summary report. However, some primary keys were wrongly assigned and the normalisation was not in 3NF.
4	(a)	Satisfactory. A high proportion of candidates stated the two stages with the usage of the tools accordingly. However, some candidates did not properly provide deliverables for the testing.
	(b)	Satisfactory. A high proportion of candidates described the reason for using DELETE to clear all the records. Weaker candidates did not state the difference between SQL1 and SQL2 or suggest two benefits of using SQL3.

Paper 2B

Question Number		Performance in General
1	(a)	Satisfactory. The majority of candidates demonstrated an adequate understanding of the characteristics of various wireless technologies.
	(b)	Satisfactory. About half of the candidates demonstrated an adequate understanding of the use of WPAN.
	(c)	Satisfactory.
	(d)	Good. In (ii), a high proportion of candidates correctly answered that UPS can provide a temporary power supply for shutting down the server during a power outage. However, about half failed to state that UPS can provide a steady power supply.
2	(a)	Good. In (ii), about half of the candidates specified that a random period of waiting time will be required for sending data if the channel is not clear.
	(b)	Satisfactory.
	(c)	Satisfactory. About half of the candidates were aware of the encryption/decryption function of WPA and WPA2.
	(d)	Poor. Only a very small number of candidates were aware of the use of MAC address filtering for network access control.
	(e)	Satisfactory. About half of the candidates demonstrated an adequate understanding of the use of communication protocols and their technical differences.
3	(a)	Poor. Only a small number of candidates demonstrated an adequate understanding of half duplex communication mode.
	(b)	Very good.
	(c)	Satisfactory.
	(d)	Satisfactory. Weaker candidates misunderstood network addressing and gave unreasonable subnet ranges and subnet masks.
	(e)	Satisfactory.
4	(a)	Satisfactory.
	(b)	Poor.
	(c)	Fair. Weaker candidates were not able to identify the limitations of P2P networks.
	(d)	Good. Candidates demonstrated a sound knowledge of network design. They correctly identified the locations of the various network devices. Some candidates were not aware of the limitations of having 5 ports in the router and 32 ports in each switch and made wrong network connections.
	(e)	Good.

Paper 2C

Question Number		Performance in General
1	(a)	Fair. Candidates in general calculated the file size of the audio and video part of a video. However, some candidates wrongly took the bit rate into the calculation, showing that they were not familiar with the concept of the bit rate of a video file.
	(b)	Very good. The majority of candidates chose appropriate specifications of a video file for authentic situations.
	(c)	Satisfactory. Only about a quarter of candidates correctly suggested different uses of the 'mouse over' effect while weaker candidates confused it with the mouse click effect. Some candidates were not aware of the provision of better service to viewers instead of the service provider. Less than half of the candidates had a clear understanding of the common uses of cookies.
2	(a)	Good. Candidates were familiar with the concept of vector images, but less than half correctly gave two advantages of using such images. About 60% of candidates used the keywords flipping, rotation and layering to explain clearly how to create the logo.
	(b)	Satisfactory. Candidates in general named only one editing effect other than brightening to refine a photo. Only a small number of candidates were aware that using transparency layers and resizing are crucial to creating the composite photo from the two given photos.
	(c)	Good. Candidates in general were familiar with the concept of aspect ratios. However, only a quarter correctly calculated the minimum resolution of the photo corresponding to the given printing resolution.
	(d)	Fair. About a third of candidates named the three and four primary colors used in RGB and CYMK respectively. However, only a small number explained clearly the differences between RGB and CYMK.
3	(a)	Good. The majority of candidates suggested at least one design feature to address the given issues and most of them gave pull-down menu, checkbox and autocorrection as their answers.
	(b)	Good. A high proportion of candidates showed a sound understanding of how to use different web design features to address the given issues. However, more than half were not aware that 'not user-friendly' was also one of the given issues and their proposed new designs were still not easily used by users.
	(c)	Very poor. A very small number of candidates demonstrated an adequate understanding of the usage of cascading style sheets (CSS), especially the application with several web pages in the web site.
	(d)	Poor. Only about a quarter of candidates explained clearly that information sent and received with the page is not encrypted and thus could potentially be stolen, read, or modified by hackers. Nevertheless, some weaker candidates were able to name SSL or HTTPS to try to address this issue.
4	(a)	Poor. Just under a third of candidates justified and explained clearly why client-side and server-side validation should be carried out in different situations. A high proportion of candidates were not aware that the workload of the server was also crucial to the choice of the validation.
	(b)	Good. Candidates in general showed a sound understanding of the use of Captcha and related web design features to address accessibility for disabled persons.
	(c)	Good. About half of the candidates traced the given script and filled in correctly most of the missing parts of the script. However, some were weak in conditional statements and comparison. A small number did not answer this part, probably showing that they were weak at scripting.
	(d)	Poor. About half of the candidates suggested using third-party hosting or cloud service as an alternative but only a small number pointed out the drawback of using a home server.

Paper 2D

Question Number		Performance in General
1	(a)	Excellent. Nearly all the candidates traced the simple pseudocode with a sequential flow.
	(b)	Good. The majority of candidates traced the pseudocode with looping.
	(c)	Good. In (c)(i), a very high proportion of candidates traced and understand the outcome of the pseudocode. In (c)(ii), only about a third of candidates provided correct parameters for the looping in order to avoid the unnecessary execution of `TR` operations in the algorithm.
	(d)	Satisfactory. In general, candidates demonstrated a basic understanding of conditional branching and looping. However, the majority failed to handle the special case that the loop parameter became a negative value and they did not use the absolute value in the loop parameter.
	(e)	Fair. Only about a quarter of candidates explained precisely the use of Gantt charts in the development of applications. Weaker candidates were unable to describe the use of such charts in terms of the dependency among various tasks and the analysis of the critical path for project development.
2	(a)	Satisfactory. In general, candidates were weak at counting the exact number of times a statement executes inside a two-level nested-for loop.
	(b)	Good.
	(c)	Good. Candidates performed well in (c)(i), (c)(ii) and (c)(iii). In (c)(iv), only about a third of candidates demonstrated the ability to compare the two different pseudocodes in terms of their memory usage.
	(d)	Good.
3	(a)	Very good.
	(b)	Very good.
	(c)	Satisfactory. The majority of candidates demonstrated a basic understanding of the implementation of a circular queue. About half provided error-free pseudocode for the implementation of `tail(Q)`. Weaker candidates failed to provide correct parameters for conditional branching when handling the cross-boundary cases in the circular queue.
	(d)	Satisfactory.
	(e)	Satisfactory. The majority of candidates described the operations of the new algorithm. However, only about half compared the two implementations and explained clearly the reason why the new implementation was faster than the old one in terms of `deq(Q)`.
4	(a)	Satisfactory. Candidates demonstrated adequate knowledge of procedural programming language and object-oriented programming language in general.
	(b)	Good. Candidates demonstrated an adequate understanding of the concepts of integration/system test and user acceptance test.
	(c)	Good. Weaker candidates had difficulty in understanding the difference between pilot conversion and the phased conversion.
	(d)	Very good.

School-based Assessment

1. The SBA marks submitted by schools were moderated in accordance with the principles and methods described in the booklet 'Moderation of School-based Assessment Scores in the HKDSE'. The quantitative results in the SBA moderation revealed that 55.0% of schools fell into the 'within the expected range' category, while 24.2% of schools were higher than expected, and 20.8% were lower than expected. A majority of teachers demonstrated a good understanding of SBA implementation, and the marking standards were generally appropriate. The sample guided tasks submitted by 77 schools were reviewed by the SBA Supervisor before the degree of adjustment was finalised.

2. Teachers are requested to inform students clearly various requirements and regulations regarding the SBA component at the beginning of the course, which include
   a. task requirements,
   b. assessment criteria,
   c. schedule of assessment,
   d. the school's regulations and administrative procedures for conducting SBA,
   e. the importance of academic honesty and proper conduct in SBA,
   f. record keeping requirements and
   g. guidance on how to acknowledge sources properly in their SBA work.

3. Teachers were requested to set guided tasks appropriate to their students' level. Students had to complete two guided tasks and record their work with products. When setting guided tasks for students, teachers are encouraged to consider whether their students can make use of the tasks to effectively demonstrate the knowledge, understanding, generic skills and practical skills learnt from the ICT curriculum.

4. Thirty hours of curriculum time is allocated for SBA. Teachers are encouraged to conduct the SBA in class to ensure authenticity. Teachers can offer general advice on SBA at the initial stage. However, they are reminded not to give specific and detailed guidance or advice in such a way as to call into question the student's authorship of his/her work.

5. Students in general completed their work with milestones such that teachers were able to evaluate it at different stages of completion and give feedback accordingly, including marks or grades on individual assessment tasks for the guided tasks.

6. Stronger students made use of what they had learnt to produce excellent deliverables in the SBA. However, their deliverables only focused on a very small number of essential elements. For example, the web pages they created usually included only one kind of multimedia element such as images. It is suggested that candidates should also include audios and videos in their web pages so as to demonstrate their multimedia editing skills.

7. Guided tasks are a part of the learning and teaching process. Students are expected develop and integrate their skills and knowledge through the SBA, and put them into practice in the examination as well as in their future lives.

8. The guided tasks have to be recorded in written documents such as project reports and presentation documents, or in other formats when appropriate.

Popularity of the Elective Part

Option	Popularity (%)
A. Databases	14
B. Data Communications and Networking	1
C. Multimedia Production and Web Site Development	61
D. Software Development	24