

# Candidates' Performance

## Paper 1A

This section consisted of 40 multiple-choice questions. Candidates' performance was generally good with an average of 28 questions answered correctly. Comparatively, candidates performed better in 'Social Implications' but had more room for improvement in 'Internet and its Applications'. Post-examination item analysis revealed the following:

1. Candidates in general had poor spreadsheet software skills (Question 7). They did not understand some basic cell formatting features. The most popular option was 'Row height' which was a wrong answer. Although the concept of two's complement for the representation of negative integers was very difficult for candidates to understand, about half of them answered correctly (Question 2).
2. Candidates had very good practical knowledge of using tablet computers and mobile devices (Question 15 and Question 16). Nevertheless, they were not able to integrate the knowledge of major components of a computer system or to understand how RAM and the motherboard interact together to perform tasks (Question 17).
3. About a third of the candidates thought that GIF, instead of PNG, was a suitable image file type (Question 20). They did not realise that PNG is a common image file type that employs lossless data compression. PNG is suitable for the web as it was designed to replace GIF and became an international standard in 2003. A high proportion of the candidates understood that tokens can enhance the security of online banking, even though they did not have any experience of online banking transactions (Question 24).
4. Candidates were able to read the flowchart and analyse its algorithm (Question 30 and Question 31). They did the straightforward deduction from the flowchart well. However, they were weak in some difficult part of the basic programming concepts. Less than half the candidates traced the algorithm with a loop correctly (Question 32).
5. A high proportion of the candidates understood the consequences of the misuse of technological innovations and the damage to the society (Question 35). They were aware of the related daily issues, for example, the four-year jail sentences given to two men who posted messages on Facebook inciting other people to riot in England in 2011. A very high proportion of the candidates realised that teenagers who are addicted to playing online games prefer playing online games to joining face-to-face social activities (Question 37). In contrast, candidates' understanding of the Internet Support Learning Programme (Question 39) was only fair. About half of them misconstrued e-learning as the main issue.

## Paper 1B (Compulsory)

1. Candidates' performance was generally satisfactory.
2. Occasionally it seemed that candidates had not read the question carefully and the answers were partial. They completed the first correct answer and missed the rest. Candidates should pay attention to the number of items required in a question.
3. In general, answers with keywords spelled wrongly are not awarded marks. Candidates did make this mistake occasionally.

Question Number	Performance in General
1 (a)	Good.
(b)	Good overall, fair in Part (iii): The information about the 'virtual keyboard' had already been given in the question. Some candidates just wrote that the virtual keyboard was not suitable for typing for a long period of time without any elaboration of the drawbacks. They needed to give the specifications (virtual keyboard) as a justification of the argument as stated in the question.
(c)	Good: Because a LAN connection is more secure and USB printers usually have a LAN port, a small number of the candidates suggested using a LAN connection for the tablet computer. However, they did not realise that the given tablet computer, like many kinds of tablet computers, did not have a LAN port.
(d)	Good: The majority of the candidates gave four correct items.
2 (a)	Good.
(b)	Poor: The majority of the candidates ignored the given information that the web site owned both the public key and the private key. A common wrong answer was that the company used the company's public key to encrypt the information whereas Janice used her private key to decrypt it. This showed a very limited understanding of the public and private key encryption systems.
(c)	Fair: Candidates should have focussed on the advantages of the arrangement in terms of security, rather than further elaborating the SMS notification, though they tried to conclude about advantages from the elaboration.
(d)	Fair: Candidates should have specifically explained what would cause the low level of security on the online transactions. Just stating 'the security of public computers was low' as the answer was not sufficient.
(e)	Good: The majority of the candidates gave acts of possible infringement of copyright in Internet piracy.
3 (a)	Good.
(b)	Poor: The majority of the candidates omitted the initiation of the variable N which was used to count the number of outputs of B. This demonstrates that they were weak in programming.
(c)	Fair.
(d)	Poor: Candidates were weak in the basic organisation of a computer system. They did not seem to be familiar with the structure of a CPU and its components.

Question Number	Performance in General
4 (a)	Good: Candidates should have paid attention to the justification for using Unicode. The popularity of Unicode was not a valid reason in the context.
(b)	Good.
(c)	Good.
(d)	Satisfactory: Candidates should note that the explanation should come with examples. The majority did not give examples to support their arguments.
5 (a)	Fair: Candidates were not able to analyse and integrate the attributes of the situation described in the question. They simply focussed on the literal meaning of the question 'What are the benefits to students of this digitisation?'. They gave some general but wrong answers such as 'saving paper' and 'lower printing cost' and some wrongly referred to issues related to electronic books.
(b)	Poor: Candidates showed limited experience of designing and constructing web pages. The majority were confused about the difference between the HTML format and multimedia elements. General comments such as 'better audio quality' without elaboration were not acceptable as answers to this question. Candidates failed to explain why the wav format was better than other common formats.
(c)	Poor: Candidates displayed a limited understanding of the benefits of using presentation files and video demonstrations. The majority were only able to use some simple adjectives such as 'quicker', 'easier' and 'attractive' to describe the benefits. Only a small number of the candidates explained specific benefits.

## Paper 2A

Candidates' performance was generally satisfactory.

Question Number	Performance in General
1 (a)	Good: Almost all candidates correctly gave the primary keys and foreign keys of PER. About half of the candidates gave at least the primary keys and foreign keys of RES or SUB.
(b)	Satisfactory: Almost all candidates understood the basic SQL command in Part (i). Candidates demonstrated their different levels of understanding of SQL when answering a command with the HAVING clause in Part (iii).
(c)	Poor: Candidates did not clearly distinguish the type of integrity that databases should uphold and confused integrity with other database concepts such as the left-outer join. They were also weak in writing subquery statements and about half of them did not write a proper subquery.
2 (a)	Good.
(b)	Satisfactory.
(c)	Satisfactory: Candidates demonstrated their creativity and simplified the SQL command in some other ways.
(d)	Fair: The majority of the candidates did not realise that updating was the major issue to be considered when maintaining a consistent database. They tried to link other issues to the context but the arguments were weak.
(e)	Very poor: Candidates were very weak in the concept of indexing. Only a very small number wrote all the indexes precisely. The majority of the candidates did not elaborate on the ethical issues related to using the search function and wrote simple and short answers such as 'It leads to unethical use'.
3 (a)	Satisfactory: A high proportion of the candidates identified the two major problems regarding the database design.
(b)	Fair.
(c)	Poor: Candidates did not give strong arguments to explain the proposition. The majority did not give any quantitative information to support their arguments.
(d)	Poor: The E-R diagram was imperfectly drawn by the candidates. Candidates did not fully understand the fundamental concepts of E-R diagrams. Some errors regarding basic E-R diagram syntax such as missing key fields and incorrect symbols were found.
4 (a)	Good: A high proportion of the candidates identified and described two common methods for the requirements collection stage.
(b)	Very good: A very high proportion of the candidates understood the data redundancy problem generated by a poor database design.
(c)	Satisfactory: The majority of the candidates understood second normal form and third normal form, but the examples they gave were not very concrete.
(d)	Satisfactory: The majority of the candidates knew that the SQL command could not rectify the issue, but only a small number of them described the structural change of the table MAIN after the execution of SQL commands.
(e)	Satisfactory: The majority of the candidates provided reasonable examples to describe the data interactions.

## Paper 2B

Candidates' performance was generally satisfactory.

Question Number	Performance in General
1 (a)	Very good: Candidates were very familiar with the practical use of routers.
(b)	Poor: About half of the candidates did not give a brief explanation to support the use of WPA2. A high proportion of the candidates did not point out the security measures of VPNs.
(c)	Very good.
(d)	Fair: Candidates did not focus on the suitability of CSMA/CD for wired networks and wireless networks.
(e)	Good: About a quarter of the candidates wrote 'use a non-overlapping channel', which was not a sensible answer.
2 (a)	Satisfactory: Candidates demonstrated their understanding of the basic concept of data encapsulation.
(b)	Good: A very high proportion of the candidates eliminated the choice of FTP and select TCP and UDP for the services.
(c)	Fair: A very high proportion of the candidates selected the best error detection, but the majority did not justify their answer.
(d)	Very poor: Candidates were not familiar with the mechanism of IPv6 in the development of the Internet. A very high proportion of the candidates answered 'IPv6 supports more addresses' but they were not able to describe a design feature of IPv6.
3 (a)	Fair.
(b)	Fair: About a third of the candidates did not understand the basic concept of multiplexing and failed to make a logical description of the signal transmission.
(c)	Very good: A very high proportion of the candidates were able to give different examples to illustrate the benefits of using duplex communication.
(d)	Satisfactory.
(e)	Satisfactory: Candidates were not aware of the given designs differences from the common network topologies and did not analyse the underlying issues that Receiver R might encounter.
4 (a)	Fair: Candidates were familiar with the basic configuration of a network device (IP address and subnet mask). However, a very high proportion of the candidates were not able to explain why the Employee Zone is a Class C network.
(b)	Poor: About half of the candidates just repeated the sentence in the question and failed to describe the relationship between a firewall device and the respective potential security risks.
(c)	Poor: A high proportion of the candidates were not able to describe the data recovery of RAID level 5. They failed to explain the operation of UPS when the NAS device encountered a power outage.
(d)	Good: A high proportion of the candidates used their practical experience to explain how to use various ICT skills to tackle the network issues.
(e)	Very good: A very high proportion of the candidates understood the major duties of a network engineer.

## Paper 2C

Candidates' performance was generally satisfactory.

Question Number	Performance in General
1 (a)	Fair: A high proportion of the candidates named the 'mouse over' effect but did not relate the codes to text-to-speech function.
(b)	Fair.
(c)	Satisfactory: A small number of the candidates used some vague terms such as 'more convenient' and 'fast' without further explanation to compare the two proposals. A small number of the candidates did not answer from the user's perspective.
(d)	Poor: Almost all the candidates were not familiar with the usage of 'anchor' in web page design. Though candidates answered 'clicking OK button may get no web page', they were not able to explain briefly why no web page was shown.
2 (a)	Poor: A very high proportion of the candidates were not familiar with the MIDI file format.
(b)	Very good: A very high proportion of the candidates identified how the sampling rate and sample size affect the sound quality. The majority of the candidates estimated correctly the file sizes with respect to the audio specifications of different formats.
(c)	Satisfactory: A very high proportion of the candidates named the features that can be provided in a web site for students with special educational needs. However, half of them were not able to explain clearly how these features can benefit these students.
(d)	Very good.
3 (a)	Good: A high proportion of the candidates were skilled in calculating the approximate file size of a scanned image. A small number of the candidates wrongly answered that lossy is compressed while lossless is not compressed.
(b)	Poor: Nearly all the candidates were not aware of the techniques for cutting an image into pieces which are then grouped with text and stored in appropriate cells. Only a small number of the candidates named the usage of Cascading Style Sheet (CSS).
(c)	Satisfactory: A high proportion of the candidates described the difference between the proposals but they were weak in giving clear explanations. They were good at identifying the advantages and disadvantages of SWF and GIF formats, however.
4 (a)	Very good: Almost all the candidates stated the benefits to Mr. Li and students.
(b)	Fair: Candidates did not understand how a client-side script works in a HTML file. They mixed up client-side scripting with the server-side scripting.
(c)	Satisfactory: About three quarters of the candidates realised that an external counter service can be employed.
(d)	Satisfactory: The majority of the candidates had a sound knowledge of and clear concepts of script writing. However, they were not able to fully apply the variables and notation described in the question.
(e)	Satisfactory: Only a small number of the candidates skillfully handled the arrays.



## Paper 2D

Candidates' performance was generally satisfactory.

Question Number	Performance in General
1 (a)	Good: A high proportion of the candidates traced the algorithm correctly. However, a small number gave 64 as the range without adding '0-63' or '<64'.
(b)	Good: A high proportion of the candidates were able to identify that ALG2 executes fewer iterations than ALG1 does. However, they failed to support the proposition by giving the number of iterations needed for ALG1 and ALG2.
(c)	Fair: Candidates had a basic knowledge of compilers and interpreters. About two thirds successfully differentiated between these two translators.
2 (a)	Good: Candidates were generally able to understand and analyse the data structure described in the question and simulate the execution of the stack. They demonstrated a sound knowledge of stacks and formulated the ideas in using two stacks in the operation.
(b)	Satisfactory: A high proportion of the candidates knew the two pieces of information, P and Q. However, about half of them were not able to state the use of the flag.
(c)	Good: Candidates demonstrated a sound understanding of different approaches, including the direct cutover approach, to converting a system. They also demonstrated an adequate knowledge of tests in the system development cycle. However, the majority were not able to differentiate the purposes of different tests precisely.
3 (a)	Poor: A high proportion of the candidates did not use the subprogram myrand. A minority of the other candidates did not realise that (myrand(N)+1) instead of myrand(N) should be used to generate a random number between 1 to N.
(b)	Good: Candidates demonstrated their knowledge of good programming style.
(c)	Satisfactory: Candidates used relevant programming skills to solve the problem but the subprograms they wrote usually contained syntax errors.
(d)	Satisfactory: A high proportion of the candidates suggested appropriate methods to collect user requirements.
4 (a)	Good: The majority of the candidates were familiar with file Input/Output.
(b)	Satisfactory: Candidates analysed the change of the program statement and formulated the outcome from a general perspective. However, the majority failed to identify the content of A that requires the longest computation time to sort.
(c)	Satisfactory: The majority of the candidates demonstrated an adequate knowledge of logic programming to solve the queries, but half of them were not able to correctly identify the major difference between logic languages and procedural languages.

## School-based Assessment (SBA)

General comments and recommendations

- The SBA component consists of one project assignment. It is evaluated in accordance with the following categories:
  - Objective & Analysis
  - Design & Implementation
  - Practical ICT Skills
  - Testing & Evaluation
  - Conclusion & Discussion
  - Documentation
  - Creativity
  - Project Management

Two project titles were provided to teachers, who were also allowed to provide other school-based project titles to suit their students' needs where necessary. A small number of schools provided additional project titles to their students.

- The SBA marks submitted by schools were moderated in accordance with the principles and procedures described in the booklet *'Moderation of School-based Assessment Scores in the HKDSE'*. The quantitative results in the SBA moderation showed that 50.2% of schools fell into the 'within the expected range' category, while 27.4% of schools were higher than expected, and 22.4% were lower than expected. Of the schools with marks higher or lower than expected, the majority deviated only slightly from the expected range.
- One SBA Supervisor and 25 District Coordinators were appointed to oversee and support the implementation of SBA. They worked with teachers through the SBA conferences, territory-wide sharing sessions, district group meetings and a teachers' online e-platform. The e-platform allowed teachers to download the 'Resource Package on Professional Development for Teachers in Preparation for the School-based Assessment Component of HKDSE Information and Communication Technology', which contains project samples and other teaching materials. They were also able to communicate with each other through online discussion forums, thus creating their own SBA support community.
- Students' performance was generally fair. Nearly half of the students were fully aware of the requirement that the report writing should correspond to the scope they had defined and the prototypes they had produced. These students had included, described and justified the use of the curriculum elements for the Elective Part they had selected. They adequately described the objectives of the project in detail and justified the underlying principles of the design for the systems they had developed. However, only a small number of students included proper testing plans in their reports.

In Project Title 1, students were not aware that they only needed to provide solutions to 'some' of the requirements listed for the examination provider. A small number of the students were very creative in considering the possible social issues that would arise from the use of ICT in the context.

In Project Title 2, most were aware that the games they designed should aim at improving children's English vocabulary. A minority focused on the fun part of game design, such as the rules, however, and did not address the educational elements.

The majority of students only applied general information and knowledge obtained from the Internet to design and implement their projects. Despite the fact that substantial amount of data and information had been made reference to, there was little evidence of in-depth analysis or critical thinking in the reports. Students should focus on the quality, instead of the quantity, of their reports. A small number of the project assignments did not include any prototype of an application. Those students failed to demonstrate their practical ICT skills, which is crucial to the SBA.

5. In completing the SBA, students were requested to sign a declaration form to confirm that the work they produced was their own. It is important for students to record the sources of information used in their project report and acknowledge them properly in their work for a fair assessment. The HKDSE Examination Regulations stipulate that a candidate may be liable to disqualification from part or the whole of the Examination or suffer a mark or grade penalty for breaching the regulations. Some examples on how to acknowledge sources properly are provided in the booklet “HKDSE Information on School-based Assessment”, which is available on the HKEAA website (<http://www.hkeaa.edu.hk/en/sba/>).