

Candidates' Performance

Paper 1A

This section consisted of 40 multiple-choice questions. Candidates' performance was generally satisfactory with an average of 25 questions answered correctly. Comparatively, they performed better in 'Social Implications' but worse in 'Information Processing' and 'Basic Programming Concepts.' Post-examination item analysis revealed the following:

1. Questions 6 and 7 test candidates' ability to integrate different concepts in 'Information Processing'. Nearly half of the candidates were able to identify the data type for SID in STUDENT in Question 6. Many other candidates did not interpret the meaning of the leading zeros in the data in SID and thought that the data made with digits must be integer.

Only a third of the candidates demonstrated a sound understanding of common spreadsheet functions and SQL commands in Question 7. Candidates in general were weak in the integrated use of various application software.

Answer Questions 6 and 7 with reference to the following database table STUDENT.

STUDENT

NAME	SID	CLASS
John Ho	18110	1A
Mary Li	09544	2C
Peter Wong	17623	3B
Greg Li	06308	2A

⋮

Q.6 What is/are the possible data type(s) for SID in STUDENT?

- (1) Integer
- (2) Character
- (3) Boolean

- A. (1) only (39%)
- * B. (2) only (49%)
- C. (1) and (3) only (7%)
- D. (2) and (3) only (5%)

Q.7 STUDENT is exported into a spreadsheet. What spreadsheet feature produces a similar output to executing the following SQL command in a DBMS tool?

```
SELECT CLASS, COUNT(*)
FROM STUDENT
GROUP BY CLASS
```

- A. Sorting (36%)
- B. Cell references in formulas (25%)
- C. Object Linking and Embedding (6%)
- * D. Pivot table (33%)

2. Candidates demonstrated adequate knowledge of data representation in computers. In Question 12, nearly 60% of the candidates were able to correctly apply the binary number system to calculate the number of possible addresses in IPv6.

Q.12 An IP address (IPv6) consists of 8 groups of 4-digit hexadecimal numbers separated by colons, as shown in the following example:

2001:08AB:2347:AFF0:1234:CC23:98D2:1A45

How many possible addresses are there in this IP addressing?

- A. 2^{32}
 - * B. 16^{32}
 - C. 32^2 (20%)
 - D. 32^{16} (59%)
- (5%)
(16%)

3. In Question 13, candidates demonstrated adequate knowledge of presentation software. However, some able candidates chose Option C as their answer and thought that 'Index' was more important when creating a self-running presentation.

Q.13 Which of the following is the least important when creating a self-running presentation?

- A. Template
 - B. Slide layout (22%)
 - C. Insertion of pictures (6%)
 - * D. Index (20%)
- (52%)

4. In Question 19, about a third of the candidates demonstrated comprehensive knowledge and understanding of computer memory. This question tests candidates' understanding of fundamental functions of different kinds of computer memory and candidates should be able to deduce and compare the data transfer rates of the computer memory. From the response figures, it was speculated that many candidates did not understand some fundamental knowledge of SSD, memory cache and RAM, which are essential components in modern computers.

Q.19 Arrange the following in ascending order by data transfer rate.

- (1) Solid State Drive (SSD)
- (2) Memory cache
- (3) RAM

- * A. (1), (3), (2) (38%)
- B. (1), (2), (3) (17%)
- C. (3), (2), (1) (27%)
- D. (3), (1), (2) (18%)

5. About half of the candidates demonstrated a sound understanding of 'Networking and Internet Basics'. In Question 24, they were able to identify the advantages of leased line and broadband and compare them precisely. However, a quarter of the candidates had difficulty in demonstrating basic knowledge of the network connections and chose Option B as the answer. Obviously, they did not understand the use of leased line in the commercial sector.

Q.24 What is/are the advantage(s) of using a network connection on a leased line instead of by broadband?

- (1) The connection is more reliable.
- (2) The cost is lower.
- (3) The bandwidth is guaranteed.

- A. (1) only
- B. (2) only
- * C. (1) and (3) only
- D. (2) and (3) only

(18%)
(25%)
(48%)
(9%)

6. Question 29 tests candidates' ability to use Boolean logic in solving a problem. 41% of the candidates applied thorough analytical skills to correctly evaluate the three logical expressions. They demonstrated comprehensive knowledge of Boolean logic for algorithm design.

Q.29 age is an integer variable and IsStudent is a Boolean variable. Which of the following Boolean expressions produce the same result?

- (1) $(age < 25) \text{ AND } (IsStudent = \text{TRUE})$
- (2) $\text{NOT } ((age \geq 25) \text{ OR } (IsStudent = \text{FALSE}))$
- (3) $(age > 25) \text{ OR } (IsStudent = \text{TRUE})$

- * A. (1) and (2) only
- B. (1) and (3) only
- C. (2) and (3) only
- D. (1), (2) and (3)

(41%)
(16%)
(22%)
(21%)

Performance in General

Question Number	
1	<p>(a) Good. About two thirds of the candidates were able to correctly state the benefits of the specific systems. However, some candidates wrongly thought that 'anywhere' and 'anytime' were the benefits. They only stated the benefits of web-based systems, but not the benefits of the specific systems respectively.</p> <p>(b) Satisfactory. Many candidates gave 'font size' as one of the correct examples of the major concerns. However, only 10% of the candidates gave three correct examples. The majority of the candidates answered 'simple design', 'simple layout' or 'user-friendly'. Candidates should realise that such answers without proper elaboration were too general and would not be awarded any mark.</p> <p>(c) Fair. Weaker candidates wrongly suggested the need of cross platform as a technical consideration in (c)(i) and answered the need of various types of mobile devices which was too general. In (c)(ii), some candidates wrongly answered the needs to address/correct bugs encountered in prior versions. They did not study the question carefully and were not aware of the requirement of different versions of the mobile application to be developed at the same time. In (c)(iii), weaker candidates stated 'easier to use' or 'everyone has a smart phone' as their answer. The first one was too general whereas the second one was irrelevant.</p> <p>(d) Satisfactory. The majority of the candidates were able to identify the need to choose 'districts and clinics' as well as to confirm the choice in the layout design. However, some candidates only included the time, and forgot to include the choice of date in the layout design.</p>
2	<p>(a) Good. Only 15% of the candidates got full mark in (a)(iii). Some candidates gave a very large number, say 65,536 or more. It seems that they mixed up the concepts of the number of bits required to store the password with the number of possible passwords to be stored.</p> <p>(b) Good. Candidates performed quite good in (b)(i) and (b)(ii). Weaker candidates got no marks for (b)(ii) by stating that the browser did not support playing the video without proper elaboration as a possible reason. In fact, the issue was related to the player or the Codec instead to the browser. In (b)(iii), many candidates stated that quoting the source was a way to handle the copyright issue. However, citation does not solve the copyright issue, which is the unauthorised use of other people's photos in a personnel web site. Copyright infringement can be avoided only by obtaining the copyright owner's permission, using copyright free photos, or purchasing the right to use the photos.</p>
3	<p>(a) Good. Weaker candidates wrongly used SUM instead of COUNTIF to find the total number of students in the formula in (a)(ii).</p> <p>(b) Satisfactory. Weaker candidates just wrote 'not unique' as their answer in (b)(i) and did not give an example to support their answer.</p> <p>(c) Satisfactory. About half of the candidates were able to give the correct output.</p> <p>(d) Satisfactory. In (d)(i), weaker candidates just answered adding effects to the text or images without elaboration. The answer was too general and would not be awarded any mark. In (d)(ii), only 25% of the candidates wrote a concise, correct answer. Some candidates answered a hyperlink as a function to insert or link the spreadsheet into the presentation file. Their concept on Object Linking and Embedding was weak.</p>

Question Number	Performance in General
4	<p>(a) Good. About half of the candidates correctly gave stable connection and lower security risk in (a)(i). However, some candidates answered 'faster speed', which was too general and would not be awarded any mark.</p> <p>(b) Fair. About 20% of the candidates were able to clearly explain the concept of data packets and the use of IP addressing in (b)(i). In (b)(ii), only 5% of the candidates were able to answer correctly. Some candidates focused their explanation on the security and stability of the broadcasting, instead of the technical consideration about streaming technology.</p> <p>(c) Very good. About half of the candidates were able to correctly give three suggestions to reduce the health hazard.</p> <p>(d) Good.</p>
5	<p>(a) Very good. Candidates demonstrated their competence in understanding the algorithm.</p> <p>(b) Satisfactory. Some candidates got full marks for (b)(i)(2) and (b)(iii), but scored no marks for (b)(i)(1) and (b)(ii). Their understanding of the modified algorithm was weak.</p> <p>(c) Good. In (c)(i), many candidates stated that RAM only served as storage but not for calculation. Their concepts of loading program into RAM and the related computer operations were flimsy.</p>

Performance in General

Question Number	
1	<p>(a) Good. Candidates in general, demonstrated a good understanding of the person-in-charge of different stages in the development lifecycle.</p> <p>(b) Satisfactory. In (b)(i), only a quarter of the candidates were able to provide the suggested deliverables correctly.</p> <p>(c) Good. Candidates demonstrated good knowledge to complete the ER diagram. Some candidates were not able to handle relationships in the database design when a requirement description had three entities altogether.</p> <p>(d) Satisfactory. About 30% of the candidates provided actions for avoidance of violating ethical principles.</p>
2	<p>(a) Good.</p> <p>(b) Very Good. Nearly all the candidates identified one or two derived attributes.</p> <p>(c) Good. About 30% of the candidates were able to conduct the database normalisation correctly in (c)(ii).</p>
3	<p>(a) Good. Weaker candidates wrongly considered data types as different constraints.</p> <p>(b) Satisfactory. Candidates should be aware that enclosing a Boolean expression within a pair of quotation marks was incorrect in SQL.</p> <p>(c) Satisfactory. About 30% of the candidates answered correctly. Weaker candidates wrongly selected some data field in the sample rental report as the index field, such as 'Location' which was not an appropriate one. Moreover, some candidates did not consider the time information to work out the calculation of the 'percentage rented out'.</p> <p>(d) Satisfactory. Weaker candidates were not aware of the overall interface design and they only focused on the types of input components.</p>
4	<p>(a) Good.</p> <p>(b) Good. Weaker candidates were not aware that the output of Year() function was numeric.</p> <p>(c) Satisfactory. Weaker candidates in general had difficulty in using NOT IN and Left Join.</p> <p>(d) Satisfactory. Candidates were able to give an SQL command, but weaker candidates were not familiar with sub-query, GROUP BY and HAVING.</p> <p>(e) Good. Weaker candidates wrongly used MINUS instead of (AVG1-AVG2).</p> <p>(f) Satisfactory. About a third of the candidates were able to point out the referential integrity problem.</p>

Paper 2B

Question Number	Performance in General
1 (a) (b) (c) (d)	Satisfactory. In (a)(i), only 20% of the candidates were able to identify the difference between a switch and a hub. Satisfactory. In (b)(i), only 20% of the candidates were able to identify the characteristics of Access Points with 2.4 GHz and 5 Hz frequencies. Satisfactory. Satisfactory. Stronger candidates were able to give a clear illustration on the data encapsulation process across layers in a TCP/IP reference model.
2 (a) (b) (c)	Good. Some candidates were unable to identify that 192.168.0.5 belongs to a class C network. Satisfactory. In (b)(ii), less than 10% of the candidates were able to determine the subnet range. Good. In general, candidates demonstrated an adequate understanding of network design, and correctly identified the locations of the various network devices. Some candidates did not realise the limitation of 48-port switches.
3 (a) (b) (c) (d) (e)	Satisfactory. Nearly half of the candidates were familiar with the basic knowledge of VPN. Satisfactory. Fair. The majority of the candidates overlooked the technical involvement by users for the VPN setup. Satisfactory. The majority of the candidates demonstrated an adequate understanding of the security functions of a firewall. Good. A high proportion of the candidates correctly answered that UPS can provide temporary power supply to shut down the servers when power outage.
4 (a) (b) (c) (d) (e)	Excellent. Good. Satisfactory. Weaker candidates were not able to differentiate asynchronous transmission and synchronous transmission. Satisfactory. About a third of the candidates were able to state the functions of TCP and IP and they demonstrated an adequate understanding of User Datagram Protocol (UDP). Good.

Question Number	Performance in General
1	<p>(a) Fair. Candidates demonstrated an elementary understanding of the general characteristics of a MIDI file. Only a very small number of candidates were able to identify that the digitalisation makes the editing of MIDI files easily.</p> <p>(b) Poor. Only a small number of candidates were able to name the alternative text feature. However, many candidates were able to explain the use of screen reader for helping the blind people to select the show.</p> <p>(c) Good. Candidates in general showed a good understanding of the differences between MP3 and WAV file formats. However, some candidates did not pay attention to the requirement of 'other than audio control buttons' when they gave out the attributes of embedded background music.</p> <p>(d) Satisfactory. A high proportion of the candidates were able to show the calculation for the estimation. However, a few candidates gave a wrong answer when converting the unit of their answers into MB. Candidates should be aware of the meaning of MB.</p>
2	<p>(a) Satisfactory. Candidates showed a good understanding on the client information sent by the browser to the server. Weaker candidates mixed up this kind of information with the metadata.</p> <p>(b) Good. A high proportion of the candidates showed a good understanding of how the system checks and compares the usernames stored in the database at the server side. However, more than half of the candidates failed to explain how the use of a partial password can enhance the security.</p> <p>(c) Very poor. The majority of the candidates demonstrated that they had little idea about how the colour range and the colour depth can be reduced to meet the printer's specification by dithering.</p> <p>(d) Very good. Candidates were familiar with how to set up clickable areas with different hyperlinks of web pages. However, only a small number of the candidates were able to name the image map feature.</p> <p>(e) Good. Candidates were familiar with the properties of JPG format.</p> <p>(f) Poor. Weaker candidates wrongly suggested technical adjustments for the users instead of the company.</p> <p>(g) Poor. Only a small number of candidates were able to explain clearly the concept and the differences between 'progressive' and 'interlaced'. Some weaker candidates wrongly mixed it up with the aspect ratio.</p>

Question Number	Performance in General
3	<p>(a) Fair. The majority of the candidates were not aware of the requirement that the additional web design features can help users look into the search results easily. Their answers in general only related to the search page but not the search results.</p> <p>(b) Good. The majority of the candidates were able to give potential issues for users in all parts. However, only a small number of candidates were aware that the radio buttons force users to select one option once users click them.</p> <p>(c) Good. Candidates were familiar with the concept of how to design a good web page, especially the use of pull-down menu, slider, radio button and check box for data input.</p> <p>(d) Very good. Weaker candidates wrongly answered how GPS can help the restaurant, not the users.</p> <p>(e) Satisfactory. About one third of the candidates were able to identify that cookies can store personal preferences of users and keep them for login next time. However, only a very small number of candidates were able to describe clearly how cookies can help to improve the web site. Weaker candidates confused cookies with the server side scripts.</p>
4	<p>(a) Fair. The majority of the candidates only recited and wrote down the explanation of what HTML metadata is and failed to give an appropriate example. Some weaker candidates did not attempt this part at all.</p> <p>(b) Satisfactory. Candidates showed a good understanding on domain name. Only a very small number of candidates were aware of the requirement to register .org in Hong Kong. Moreover, they were aware of the information security issues when employing web hosting services as it is managed by the third party.</p> <p>(c) Fair. Only a very small number of the candidates were able to describe an error-free script for updating continuously the score of the player. While a small number of candidates did not add up N to SUM at the very beginning of the script, some other candidates did not re-initialise the value of SUM once it is greater or equal to 10.</p>

Performance in General

Question Number	
1	<p>(a) Good. About 70% of the candidates were able to understand the operations of a stack system, and were able to complete the simulation of a sequence of stack operations on a single stack.</p> <p>(b) Good. The majority of the candidates were able to trace a program with control logic flow (conditional branching) and stack operations on two stacks.</p> <p>(c) Very good. Candidates showed good ability of writing simple pseudocode with stack operations.</p> <p>(d) Good. Stronger candidates were able to reuse the previously defined function to solve a more complex stack problem.</p> <p>(e) Satisfactory. In general, candidates demonstrated a basic understanding of breakpoints. However, the majority of the candidates were weak at applying the breakpoint function in coding.</p>
2	<p>(a) Very good.</p> <p>(b) Good. The majority of the candidates demonstrated a good understanding of the binary search concept. However most of the candidates were unable to express the binary search strategy clearly with pseudocode. Weaker students were unable to provide a correct search range update inside the loop.</p> <p>(c) Satisfactory. In general, candidates were not familiar with the limitation of using linked-list data structure to implement the binary search strategy. Their concepts of forward access, backward access and random access are weak. Candidates demonstrated difficulties in comparing and contrasting the use of array and linked list data structures.</p>
3	<p>(a) Good.</p> <p>(b) Good.</p> <p>(c) Satisfactory. Candidates demonstrated an adequate understanding of procedural programming language and object-oriented programming language in general. However, only 20% of candidates were able to provide the advantage of procedural programming language over object-oriented programming language.</p>
4	<p>(a) Excellent.</p> <p>(b) Good. The majority of the candidates were able to handle nested looping and provide a set of precise looping parameters for traversing 2D arrays.</p> <p>(c) Very good.</p> <p>(d) Excellent.</p> <p>(e) Very good. About 80% of the candidates were able to trace the complex 2D array processing strategy described in the question with a given example.</p> <p>(f) Satisfactory. Weaker candidates had difficulty in understanding the logic of the two algorithms and were unable to provide a technical comparison.</p>

School-based Assessment (SBA)

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 58.2% of schools fell into the 'within the expected range' category, while 23.2% of schools were higher than expected, and 18.6% were lower than expected. Majority of the teachers demonstrated a good understanding about the SBA implementation, and hence the marking standards were generally appropriate. The sample guided tasks submitted by 71 schools were reviewed by SBA Supervisor before confirming the degree of adjustment in the moderation process.
2. An 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 made it possible for 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 samples and other teaching materials. Moreover, two batches of samples of Guided Tasks with 16 samples have been developed for teachers to download through the HKEAA web site.
3. Teachers are reminded to inform students clearly various requirements and regulations regarding the SBA component at the beginning of the course, which include task requirements and assessment criteria, schedule of assessment, the school's regulations and administrative procedures for conducting SBA, the importance of academic honesty and proper conduct in SBA, record keeping requirements and guidance on how to acknowledge sources properly in their SBA work.
4. Teachers were requested to set guided tasks appropriate to their students' level. Students had to complete two guided tasks and recorded 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 their knowledge and understanding, generic skills and practical skills learnt from the ICT curriculum. The guided tasks had to be recorded in written documents such as project reports and presentation documents, or in other formats when appropriate.
5. It is encouraging that some students completed guided tasks with creative work in developing databases, computer networks, web sites and computer programs. They took this chance to develop and apply their skills and practise their ICT knowledge in a meaningful context.
6. Thirty hours of curriculum time is allocated for SBA. Teachers are encouraged to conduct the SBA in class to ensure the 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 put into question the student's authorship of his/her work.
7. Teachers are advised to set milestones for their students in such a way that they can evaluate students' work at different stages of completion and give student feedback accordingly, including their marks or grades on individual assessment tasks for the guided tasks.
8. Guided tasks are a part of the learning and teaching process. Teachers should use the tasks to help students develop and integrate their skills and knowledge, and put them into practice for the examination as well as in their future lives.
9. It is encouraging that some schools arranged a cross-level sharing platform among subject teachers as there were several teachers teaching this subject and conducting guided tasks in different levels.
10. It is found that some new teachers did not join the annual SBA sharing session held by the HKEAA. It is advised that they should seek advice from their District Coordinators and/or the subject manager of the HKEAA when they are not familiar with the SBA requirements and the exact operation of the whole guided tasks.

The Popularity of the Elective Part

Option	Popularity (%)
A. Databases	13
B. Data Communications and Networking	2
C. Multimedia Production and Web Site Development	61
D. Software Development	24