

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. They performed better in 'Social Implications' and worse in 'Information Processing.' Post-examination item analysis revealed the following:

1. In Question 3, about a third of the candidates demonstrated a comprehensive understanding of data validation. They understood the limitation of data validation in that the input cannot be error-free.

Q.3 What are the advantages of using the following calendar box over a text box for entering a date?

| April 2021 | | | | | | |
|------------|----|----|----|----|----|----|
| Mo | Tu | We | Th | Fr | Sa | Su |
| | | | 1 | 2 | 3 | 4 |
| 5 | 6 | 7 | 8 | 9 | 10 | 11 |
| 12 | 13 | 14 | 15 | 16 | 17 | 18 |
| 19 | 20 | 21 | 22 | 23 | 24 | 25 |
| 26 | 27 | 28 | 29 | 30 | | |

- (1) Avoids impossible dates.
- (2) Ensures that the input is error-free.
- (3) Provides a user-friendly interface.

- | | | |
|------|------------------|-------|
| A. | (1) and (2) only | (12%) |
| * B. | (1) and (3) only | (39%) |
| C. | (2) and (3) only | (4%) |
| D. | (1), (2) and (3) | (45%) |

2. Question 11 tests the understanding of character sets, which is fundamental knowledge in ICT. Only about a quarter of the candidates answered correctly. It seems that weaker candidates did not know that binary representation is not the key to using a character set in computers.

Q.11 Why should characters be represented by character sets such as ASCII in computers?

- (1) To standardise the data representation
- (2) To enhance the data encryption
- (3) As data in computers is stored in binary numbers

- | | | |
|------|------------------|-------|
| * A. | (1) only | (25%) |
| B. | (2) only | (4%) |
| C. | (1) and (3) only | (61%) |
| D. | (2) and (3) only | (10%) |

3. In Question 22, from the response figures, almost all candidates understood the top-level domain. About half of the candidates understood the concept of URL and domain name.

Q.22 Which of the following describe(s) the URL, *https://www.abc.edu.hk/en/*?

- (1) *en* is a path on the web server.
- (2) The domain name is *abc*.
- (3) The web site is registered as an educational institution in Hong Kong.

- A. (1) only (3%)
- B. (2) only (3%)
- * C. (1) and (3) only (55%)
- D. (2) and (3) only (39%)

4. In Question 24, about half of the candidates demonstrated a comprehensive knowledge of web page design. Weaker candidates thought that the user-friendliness of browsing was not important. It seems that they did not have sufficient practical experience in writing web pages.

Q.24 Which of the following should be considered when designing web pages?

- (1) The time for loading web pages
- (2) The user-friendliness of browsing
- (3) The colour combination

- A. (1) and (2) only (6%)
- B. (1) and (3) only (5%)
- C. (2) and (3) only (40%)
- * D. (1), (2) and (3) (49%)

5. Question 28 tests candidates' ability to use Boolean logic in solving a problem. 27% of the candidates understood Algorithm 1 and correctly completed Algorithm 2. They demonstrated thorough analytical skills to compare different solutions to the same problem.

Q.28 The final values of *X* and *Y* in the following two algorithms are the same:

Algorithm 1

```
X ← 10
Y ← 0
REPEAT
  X ← X + 1
  Y ← Y + 2
UNTIL (X = 20) OR (Y > 15)
```

Algorithm 2

```
X ← 10
Y ← 0
WHILE Missing part DO
  X ← X + 1
  Y ← Y + 2
```

What is the missing part in Algorithm 2?

- A. (*X* = 20) AND (*Y* > 15) (4%)
- B. (*X* = 20) OR (*Y* > 15) (14%)
- * C. (*X* <> 20) AND (*Y* <= 15) (27%)
- D. (*X* <> 20) OR (*Y* <= 15) (55%)

Paper 1B

| Question Number | Performance in General |
|-----------------|--|
| 1 | <p>(a) Good. Weaker candidates gave a vague answer, such as 'faster', without further elaboration.</p> <p>(b) Fair. Some candidates explained that a hard disk should be considered for storing large video files, which was irrelevant to the question on the process - 'to edit and render videos'. Their answers focused wrongly on the outcome instead of on the process.</p> <p>(c) Fair. Candidates' understanding of the functions of the operating system seems to be narrow. Some candidates even wrongly related the issue to anti-virus protection. For the issue of cloud storage in (c)(ii), weaker candidates mixed up the scopes of a network and an Internet connection. Accessing network services is not equivalent to accessing Internet services.</p> <p>(d) Fair. Candidates showed a basic understanding of the differences between open source software and freeware.</p> <p>(e) Satisfactory. Weaker candidates wrongly answered that a software company would 'steal' users' personal data for illegal purposes. Regarding the collection of users' data, the software company would make use of the data to help improve its software as well as communications with the users. The collection of the users' data did not imply causing harm to the users. Some candidates' understanding of the terms of service seems to be incorrect.</p> |
| 2 | <p>(a) Poor. Weaker candidates wrongly used <code>MAX</code> to find the second highest score.</p> <p>(b) Fair. In general, candidates' understanding of absolute and relative addressing was weak.</p> <p>(c) Fair. In (c)(i), only a quarter of the candidates understood the use of <code>COUNT</code> for finding the <code>VALUE</code> in the pivot chart. In (c)(ii), a high proportion of the candidates were able to correctly state the advantage of linking. However, they suggested no linking to the source document being an advantage for embedding, which was actually a disadvantage.</p> <p>(d) Good.</p> <p>(e) Fair. Weaker candidates chose spreadsheet as the answer, stating that it provided mathematical functions which could be used to manipulate the data. They wrongly thought that the database did not have such functions.</p> |
| 3 | <p>(a) Satisfactory. In (a)(ii), weaker candidates simply described different devices connected to the router in the diagram without any elaboration about the main function of a router.</p> <p>(b) Satisfactory. Some candidates' understanding of the data packets and the related operations seems to be weak. For instance, they wrongly stated that the packets were reassembled and then sent to computer Z. In fact, the packets were reassembled at computer Z.</p> <p>(c) Fair.</p> <p>(d) Fair. A small number of the candidates showed adequate knowledge of the firewall. Weaker candidates wrongly stated that a firewall was used for content filtering as well as protection against computer viruses.</p> <p>(e) Satisfactory. Weaker candidates wrongly stated that changing passwords regularly could help enhance the security of electronic transactions.</p> |

| Question Number | Performance in General |
|-----------------|--|
| 4 (a) | Good. Candidates showed a sound understanding of the two file types and suggested a proper improvement for the application to help visually impaired people. |
| (b) | Poor. A very high proportion of the candidates wrongly focused their answers on raising information literacy in society, such as ease of learning and awareness of AI. |
| (c) | Satisfactory. |
| (d) | Good. |
| 5 (a) | Good. |
| (b) | Fair. Weaker candidates wrongly gave 4 as the answer. They wrongly thought four 1s in the initial content of A means that the if statement on Line 3 would be executed four times. |
| (c) | Satisfactory. In (c)(ii), 'using a while loop' is a vague answer and no mark would be awarded. |
| (d) | Satisfactory. |
| (e) | Good. |
| (f) | Fair. |
| (g) | Satisfactory. |

Paper 2A

| Question Number | Popularity |
|-----------------|------------|
| 1 | 61% |
| 2 | 83% |
| 3 | 75% |
| 4 | 82% |

| Question Number | Performance in General |
|-----------------|--|
| 1 | <p>(a) Good. More than half of the candidates provided the correct SQL statement.</p> <p>(b) Satisfactory. Weaker candidates counted the duplication of participants.</p> <p>(c) Fair. Weaker candidates wrongly used <code>COUNT</code> to obtain the total reward points.</p> <p>(d) Fair. Candidates were weak in using <code>GROUP BY</code> and <code>HAVING</code>.</p> <p>(e) Satisfactory. Only a third of the candidates were able to interpret '<code>>= ALL</code>' in the SQL statement. Weaker candidates wrongly answered with an advantage of using a view and did not use the <code>MYSTEP</code> attribute directly.</p> |
| 2 | <p>(a) Very good.</p> <p>(b) Very good.</p> <p>(c) Good. The majority of the candidates were able to identify the inconsistency of some records in <code>BUS</code>.</p> <p>(d) Satisfactory. Only a small number of the candidates were able to provide a proper record for the entity integrity problem.</p> <p>(e) Good. A very high proportion of the candidates were able to provide the schema definition of these two tables and associated keys. Weaker candidates did not identify the primary key of compound attributes in <code>BVIDEO</code>.</p> <p>(f) Fair.</p> |
| 3 | <p>(a) Fair. Only a third of the candidates were able to find a potential issue in <code>PWD</code> with the <code>UNIQUE</code> constraint.</p> <p>(b) Very good.</p> <p>(c) Satisfactory. Weaker candidates gave an advantage without any explanations.</p> <p>(d) Poor. Only a very small number of the candidates were able to describe the migration steps for the two tables and suggest some possible methods to represent the 'technician' information. More than half of the candidates were able to use the <code>DROP</code> command properly.</p> <p>(e) Good. Candidates, in general, were able to sketch the layout and design that met the requirements. Weaker candidates did not write the proper annotation for their designs.</p> |

| Question Number | Performance in General |
|-----------------|--|
| 4 | <p>(a) Satisfactory. Weaker candidates were not able to find the compound attributes for the PCODE and NUM.</p> <p>(b) Very good. Candidates conducted the normalisation of ORD with suitable attributes and keys properly.</p> <p>(c) Poor. Only 10% of the candidates were able to provide the INDEX statement correctly and an explanation for the search performance.</p> <p>(d) Satisfactory.</p> <p>(e) Good. A high proportion of the candidates were able to describe how data mining can be used in the scenario. Weaker candidates were not able to provide a description relating to the context.</p> |

Paper 2B

| Question Number | Popularity |
|-----------------|------------|
| 1 | 65% |
| 2 | 82% |
| 3 | 65% |
| 4 | 89% |

| Question Number | Performance in General |
|-----------------|---|
| 1 | <p>(a) Good. A high proportion of candidates were able to name the network device and state the reasons for setting up subnets.</p> <p>(b) Satisfactory.</p> <p>(c) Good.</p> <p>(d) Satisfactory. About a third of the candidates did not realise that the maximum number of computers in Subnet B is 125.</p> <p>(e) Satisfactory. About a quarter of the candidates were able to demonstrate an adequate understanding of the use of test commands to check the network connectivity.</p> |
| 2 | <p>(a) Good.</p> <p>(b) Good. In general, candidates correctly answered that UPS can provide a temporary power supply for shutting down the server during a power outage. However, about a quarter of the candidates failed to state that UPS can provide a steady power supply during a power surge.</p> <p>(c) Satisfactory. About half of the candidates demonstrated an adequate understanding of domain and sub-domain relationships.</p> <p>(d) Satisfactory. A high proportion of the candidates were able to state that RAID-0 has better throughput. However, they did not realise that RAID-0 provides more usable storage space than RAID-1.</p> |
| 3 | <p>(a) Satisfactory. Weaker candidates wrote some brief and general descriptions of the transmission media. Candidates should give two differences from a technical point of view.</p> <p>(b) Satisfactory.</p> <p>(c) Satisfactory. About half of the candidates demonstrated an adequate understanding of the use of TCP and UDP.</p> <p>(d) Satisfactory.</p> <p>(e) Fair.</p> |
| 4 | <p>(a) Good.</p> <p>(b) Fair.</p> <p>(c) Good. A high proportion of the candidates correctly identified that an additional AP can enhance the network performance.</p> <p>(d) Good.</p> <p>(e) Satisfactory. In (e)(ii), a small number of the candidates wrongly used 1,000 instead of 1,024 to calculate the storage capacity, which is a fundamental concept in memory measurement.</p> <p>(f) Satisfactory. About half of the candidates were able to give two reasonable suggestions for the terms of use.</p> |

Paper 2C

| Question Number | Popularity |
|-----------------|------------|
| 1 | 47% |
| 2 | 82% |
| 3 | 77% |
| 4 | 95% |

| Question Number | Performance in General |
|-----------------|---|
| 1 | <p>(a) Satisfactory. About half of the candidates were able to draft a new design to address the comments of the users. However, less than a quarter of the candidates were able to suggest two different methods for applying an identical layout to several web pages in one go, especially the usage of a JavaScript library.</p> <p>(b) Fair. Candidates in general were not familiar with the concept of dpi and its related resolution calculation. Only about 20% of the candidates were able to correctly find the maximum colour depth for the given compressed image.</p> <p>(c) Fair. About a third of the candidates correctly named the steps involved in the editing processes needed, such as crop, layer mask, rotate and flip/mirror. They described precisely how to create a new image from a given one.</p> <p>(d) Very poor. Less than a quarter of the candidates understood well the usage of key frames and motion tweening for creating an animation. More than half of the candidates mentioned the generic names in certain animation software packages, but not the technical terms of the features used for the production of the animation.</p> |
| 2 | <p>(a) Poor. Less than 20% of the candidates were able to clearly describe the usage of metadata for the promotion of a web site. A small number of the candidates correctly used 'keyword' as their answer but were not able to describe correctly how it can be used for the promotion.</p> <p>(b) Fair. About a third of the candidates correctly answered while a small number of the candidates were confused with the usage of colspan and rowspan.</p> <p>(c) Excellent. Over 80% of the candidates were able to give a potential difficulty that children users might encounter with the non-robot test. Weaker candidates wrongly focused their answers on the usage of these tests on a mobile device.</p> <p>(d) Satisfactory. About 70% of the candidates were able to correctly complete the pseudocode for finding the winner. However, only about a third of the candidates understood well the concept of the random number generator and correctly used the given subprogram <code>myRAND(X)</code> to assign a random number within the designated range.</p> |

| Question Number | Performance in General |
|-----------------|--|
| 3 | <p>(a) Good. More than half of the candidates were familiar with how to estimate the file size in GB of a uncompressed video. A small number of candidates gave a correct formula for estimation but calculated the answer wrongly.</p> <p>(b) Fair. Only about a third of the candidates were able to give correct reasons why the codec needed to be used. About half the candidates were able to correctly give at least one reason why the release of an updated version of the codec is sometimes necessary.</p> <p>(c) Fair. About a third of the candidates were able to correctly give reasons for not recommending Setting B.</p> <p>(d) Poor. Only about 20% of the candidates were able to correctly give an advantage and a disadvantage of using a pop-up window for playing video on a web page. A small number of the candidates wrongly related the pop-up window to the usage of system resources but not the design of the web page.</p> <p>(e) Satisfactory. About half of the candidates were able to give a reason to support the use of cookies on the web site. Weaker candidates wrongly gave a reason for the users which in fact was a reason for the web site owner.</p> |
| 4 | <p>(a) Very good. The majority of the candidates were able to give an advantage of using radio buttons. More than 60% of the candidates demonstrated that they had adequate experience in using checkboxes and pull-down menus for multiple selections when entering information within a web page. More than half of the candidates demonstrated that they were familiar with the constraints on uploading photos onto a web site.</p> <p>(b) Very good. Over 80% of the candidates showed that they had sound knowledge of using a shopping cart in web page design. However, only about half of the candidates understood well what a two-level interdependent select list is. Less than half of the candidates were aware of using searching and sorting features for effectively listing the books.</p> <p>(c) Fair. About a third of the candidates were able to give advantages of using client-side scripts to make the shopping cart. Weaker candidates only directly recited the advantages of using client-side scripting without relating them to the given scenario.</p> <p>(d) Satisfactory. About a third of the candidates were able to describe the database stored on the server-side and the checking procedure of the discount code. Only a small number of them were able to mention the updating of the database after the discount code was used.</p> |

Paper 2D

| Question Number | Popularity |
|-----------------|------------|
| 1 | 94% |
| 2 | 96% |
| 3 | 77% |
| 4 | 33% |

| Question Number | Performance in General |
|-----------------|---|
| 1 | <p>(a) Excellent.</p> <p>(b) Very good. Nearly all candidates were able to use a simple for-loop to control the number of steps to move.</p> <p>(c) Good.</p> <p>(d) Good. The majority of the candidates completed the pseudocode correctly. Weaker candidates did not make use of the previously defined subprogram <code>PROA</code>.</p> <p>(e) Satisfactory. About half of the candidates were able to write the pseudocode for <code>PROC</code>. Weaker candidates did not notice that the cleaner had to go back to its initial state (position and heading direction). In (e)(ii), many candidates made errors in using the variable <code>D</code> to represent the number of iterations in the for-loop. About half of the candidates were aware that the for-loop is used to count the number of turns required.</p> <p>(f) Satisfactory. About half of the candidates were able to demonstrate a sound understanding of low-level languages and high-level languages. Weaker candidates thought that low-level languages are machine code and no translation is needed.</p> |
| 2 | <p>(a) Good. A very high proportion of the candidates demonstrated a sound understanding of simple stack operations. However, about half of the candidates overlooked the use of <code>N</code>. Some candidates checked an empty stack by checking <code>S=0</code>, <code>pop(S)=0</code> or <code>pop(S)=null</code>.</p> <p>(b) Good.</p> <p>(c) Good. In (c)(i), about half of the candidates answered correctly. Weaker candidates were not able to demonstrate their understanding of the required condition for the return value <code>-1</code>.</p> <p>(d) Satisfactory. Half of the candidates used the flag properly and correctly monitored the number of elements in the stack so as to do a valid addition.</p> <p>(e) Satisfactory. Candidates demonstrated an adequate understanding of the Gantt chart. About three-quarters of candidates answered (e)(i) correctly. Weaker candidates just pointed out the mistakes but did not give the respective corrections. In (e)(ii), only about a third of the candidates answered correctly. Some candidates thought that a compiler runs faster than an interpreter and they also mixed up a compiler and a compiled program.</p> |

| Question Number | Performance in General | |
|-----------------|------------------------|--|
| 3 | (a) | Excellent. |
| | (b) | Satisfactory. About half of the candidates were able to assign sequential values to a 2D array. |
| | (c) | Poor. Only a small number of the candidates were able to use random numbers for the calculation. |
| | (d) | Satisfactory. About two-thirds of the candidates answered (d)(i) correctly. Some candidates incorrectly used round brackets for array indexing. In (d)(ii), weaker candidates mentioned a flag but did not describe how to use it. In (d)(iii), only a third of the candidates were able to demonstrate a sound understanding of binary search. Some other candidates thought that binary search cannot be used for the 2D array SP. |
| | (e) | Satisfactory. Weaker candidates did not notice that in the given <code>if</code> statement, not all values of <code>i</code> and <code>j</code> can be used. It seems that their understanding of manipulating a 2D array was weak. |
| | (f) | Satisfactory. About two thirds of the candidates were able to give at least one correct reason. Weaker candidates thought that a small-scale implementation is a kind of user acceptance test. |
| 4 | (a) | Good. |
| | (b) | Fair. Only about a third of the candidates were able to understand the given program logic and make proper modifications. |
| | (c) | Satisfactory. |
| | (d) | Fair. In (d)(i), about half of the candidates gave at least one correct reason, but only a very small number of the candidates gave two reasons. Weaker candidates wrongly thought that a UAT is to collect users' feedback for improvement. |

Popularity of the Elective Part

| Option | Popularity (%) |
|---|----------------|
| A. Databases | 12 |
| B. Data Communications and Networking | 2 |
| C. Multimedia Production and Web Site Development | 56 |
| D. Software Development | 30 |