

Candidates' Performance

Paper 1A

This section consisted of 40 multiple-choice questions. Candidates' performance was generally satisfactory with an average of 26 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 were able to distinguish a distributed processing system from a real-time system and a batch processing system. The other candidates did not realise that a computer network is a must for operating a distributed processing system.

Q.3 Mary only has a computer without any network connections. Which of the following systems can she carry out?

- (1) Distributed processing system
- (2) Real-time system
- (3) Batch processing system

- A. (1) only (21%)
- B. (2) only (12%)
- C. (1) and (3) only (30%)
- * D. (2) and (3) only (37%)

2. Question 13 assesses candidates' understanding of fundamental knowledge in ICT, specifically Unicode and Big-5 code. Approximately half of the candidates answered correctly, but weaker candidates were not familiar with the basic concepts of character sets and, as a result, chose the wrong options.

Q.13 Which of the following regarding Unicode and Big-5 code is correct?

- A. In a computer, the use of Big-5 code and Unicode depends on the operating system. (13%)
- B. Big-5 code is used for representing characters in Chinese only. (19%)
- * C. Unicode is used for representing characters in English and other languages. (57%)
- D. For web browsing, the use of a character set depends on the browser. (11%)

3. In Question 14, approximately 45% of the candidates mistakenly believed that the term '16 cores' referred to the maximum number of programs that a CPU can handle. They oversimplified the operations of a CPU and lacked the understanding that the execution of a program often involves more than one core, and that each core is not solely occupied by one program.

Q.14 For a CPU with the specifications of 16 cores, 5 GHz and a 30 MB cache, which of the following are correct?

- (1) The clock rate of the CPU is 5 GHz.
- (2) The maximum number of programs that the CPU can handle at the same time is 16.
- (3) The CPU accesses data in the cache memory faster than that in RAM.

- A. (1) and (2) only (18%)
- * B. (1) and (3) only (55%)
- C. (2) and (3) only (5%)
- D. (1), (2) and (3) (22%)

4. Question 17 assesses candidates' knowledge and understanding of projectors. However, only half of the candidates answered correctly, as some mistakenly chose the option '5400rpm,' which is obviously a specification of a hard disk. It is important for candidates not only to be able to use projectors for presentations but also to understand all the specifications of a projector and their effects on the projector's operation.

Q.17 Which of the following is **not** a specification of a projector?

- A. WiFi 802.11ac supported (23%)
- B. 3800 lm (lumen) (19%)
- C. 4K UHD (Ultra High Definition) (8%)
- * D. 5400 rpm (revolutions per minute) (50%)

5. Question 30 assesses candidates' ability to use looping to solve a problem. Only 38% of the candidates demonstrated a thorough understanding of the algorithm and analytical skills to correctly determine the output.

Q.30 What is the output of the following algorithm?

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A ← 5
B ← 11
C ← 7
FOR C FROM 2 TO 3 DO
    B ← A + B
OUTPUT (A + B)
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- A. 16 (29%)
- B. 21 (28%)
- * C. 26 (38%)
- D. 32 (5%)

Paper 1B

Question Number	Performance in General
<p>1</p> <p>(a)</p> <p>(b)</p> <p>(c)</p> <p>(d)</p>	<p>Good.</p> <p>Poor. In general, candidates only stated that RAM was random access and volatile, and that increasing its size could enhance the computational power of the computer. However, they did not explain how RAM could achieve this. This indicates an insufficient understanding of the functions of RAM.</p> <p>Satisfactory. Some candidates mistakenly assumed that they were not required to install the software in Method 1, and overlooked the importance of installation and the consumption of secondary storage on the computer. It is essential to exclude the need for installation, rather than just the download, in Method 1. Additionally, in (c)(ii), some candidates provided vague answers, such as 'incompatible' or 'unsupported systems,' without giving a concrete example.</p> <p>Good. In (d)(i), candidates are expected to demonstrate their understanding of validating information by providing concrete examples.</p>
<p>2</p> <p>(a)</p> <p>(b)</p> <p>(c)</p> <p>(d)</p> <p>(e)</p>	<p>Fair. Weaker candidates mistakenly added an exclamation mark '!' in the formula.</p> <p>Satisfactory.</p> <p>Satisfactory. Approximately half of the candidates demonstrated their ability to use the SUM function to find the VALUES in the pivot chart.</p> <p>Good.</p> <p>Good. The majority of the candidates correctly drew a chart. However, weaker candidates did not utilise the data given in the sample spreadsheet and created their own set of data, such as StudID, which was unnecessary.</p>
<p>3</p> <p>(a)</p> <p>(b)</p> <p>(c)</p> <p>(d)</p>	<p>Good. The majority of the candidates showed good program tracing techniques and were able to provide the correct answers.</p> <p>Satisfactory. Some candidates were able to determine the minimum number of executions of Line 8, but did not provide the maximum number.</p> <p>Satisfactory.</p> <p>Satisfactory. Some candidates selected two sets of test data but explained the drawback of the third set as their answer. It is important for candidates to focus on the chosen test data and provide a detailed explanation.</p>

Question Number	Performance in General
4	<p>(a) Fair. Spelling mistakes or typos in Chinese were found in some answers. In (a)(ii), candidates demonstrated a weak understanding of the functions of routers and switches. Many candidates incorrectly answered that a switch has more ports than a router.</p> <p>(b) Satisfactory. Weaker candidates stated that the Internet might not be available for online shopping, which is unrealistic in today's world. They also expressed concern that hackers might steal data from online shops. However, crimes can also occur in physical shops and are not uncommon. Candidates should focus their answers on the consequences arising from the shift to online shopping.</p> <p>(c) Satisfactory. In (c)(i), weaker candidates provided a domain name as the answer, which was incorrect.</p> <p>(d) Satisfactory. In (d)(i), only about a third of the candidates answered correctly, with many others providing incorrect answers such as check digit, length check, or type check. This indicates a narrow understanding of error detection methods. In (d)(iii), only approximately 10% of the candidates answered correctly. Weaker candidates misunderstood the question in (d)(ii), which indicated the use of 14 bits instead of 5 bits in the action. Instead, they suggested that using 2-bit commands would require less storage space for the program.</p>
5	<p>(a) Fair. Weaker candidates provided a vague answer stating that it was faster and easier without mentioning any specific attributes. It is important for candidates to clearly describe their answer without ambiguity.</p> <p>(b) Fair. Weaker candidates overlooked the importance of arranging data collection during the 5-minute period, which is essential for batch processing. In (b)(ii), candidates should note that 10 Mbps is equal to $10 \times 1000 \times 1000$ bps.</p> <p>(c) Satisfactory. In (c)(i), only 15% of the candidates answered correctly. Many candidates attributed the occasional unsmooth streaming to the narrow bandwidth of the fitness centre, without explaining the underlying cause.</p> <p>(d) Poor. Only about a quarter of the candidates were able to describe the harmful consequences of a particular scenario. Weaker candidates simply mentioned virus infection without further elaboration. In fact, the scope of virus infection is very broad, and candidates should describe the specific potential harm to the user.</p>

Paper 2A

Question Number	Popularity (%)
1	70
2	76
3	64
4	90

Question Number	Performance in General
1	<p>(a) Good. The majority of the candidates were able to provide the correct SQL statement.</p> <p>(b) Satisfactory. Weaker candidates were not able to provide the correct expression of the 'September 2022' condition.</p> <p>(c) Fair. Less than half of the candidates provided the condition for 'no booking records' properly.</p> <p>(d) Fair. Candidates demonstrated weakness in using the aggregate functions GROUP BY and HAVING.</p> <p>(e) Satisfactory. Candidates encountered difficulties in describing the purpose of the SQL statement in (e)(i). Weaker candidates also misused a 'PLUS' operator in (e)(ii).</p>
2	<p>(a) Very good.</p> <p>(b) Fair. A very high proportion of the candidates faced difficulties in providing database constraints for the 'SNO' attribute. Weaker candidates incorrectly identified 'data format' as a constraint.</p> <p>(c) Satisfactory. Candidates, in general, were able to create a layout design that met the given requirements. However, weaker candidates failed to include the 'Submit' button or the feature of displaying last year's electives.</p> <p>(d) Good. The majority of the candidates correctly set the access rights. However, some weaker candidates failed to set the access rights for the 'Teacher' column.</p>
3	<p>(a) Fair. Weaker candidates incorrectly identified the 'HKID' attribute as a derived attribute.</p> <p>(b) Very good. A high proportion of the candidates were able to complete the ER diagram correctly. Weaker candidates provided incorrect minimal cardinalities.</p> <p>(c) Satisfactory. The majority of the candidates were able to identify one or two issues related to data merging. However, weaker candidates were not able to provide corresponding solutions.</p> <p>(d) Satisfactory. Only a small number of the candidates were able to accurately describe Task 2 and Task 3. However, the majority of the candidates used the DROP command correctly.</p>
4	<p>(a) Excellent. Nearly all the candidates were able to correctly identify the data dependencies.</p> <p>(b) Fair. The majority of the candidates were able to complete the SQL statement in (b)(i). However, only about a third of the candidates were able to provide the correct INDEX statement in (b)(ii).</p> <p>(c) Good. Candidates successfully conducted the normalisation of TINFO with suitable attributes and keys. However, some weaker candidates failed to identify the primary key of TICKET.</p> <p>(d) Satisfactory.</p>

Paper 2B

Question Number	Popularity (%)
1	50
2	87
3	93
4	70

Question Number	Performance in General
1	<p>(a) Fair. About a third of the candidates demonstrated adequate knowledge of the basic concepts of IP configuration. Weaker candidates were unable to identify that 192.168.20.256 is not a valid IP address.</p> <p>(b) Poor. Only a small number of the candidates were aware of the collision issue that can arise in a busy network.</p> <p>(c) Fair. Approximately half of the candidates were able to correctly state that a router uses IP addresses to determine the sending path. However, only about a quarter of the candidates were able to determine the subnet ranges and subnet masks.</p> <p>(d) Fair.</p>
2	<p>(a) Good.</p> <p>(b) Fair. Weaker candidates provided brief and general descriptions of mobile networks and satellite technology, without delving into technical details. Candidates should strive to provide answers from a technical point of view.</p> <p>(c) Satisfactory.</p> <p>(d) Fair.</p> <p>(e) Fair.</p>
3	<p>(a) Very poor. A high proportion of the candidates provided brief and general descriptions of RFID technology, without highlighting specific advantages related to the application from a technical point of view. Candidates should strive to provide specific technical advantages related to the application.</p> <p>(b) Good. A high proportion of the candidates demonstrated an adequate understanding of setting folder access rights.</p> <p>(c) Satisfactory.</p> <p>(d) Good. A high proportion of the candidates were able to identify two suitable locations in the map for the additional APs.</p> <p>(e) Fair. Weaker candidates did not provide a clear explanation of the sequential data recovery requirement for Method 1.</p>
4	<p>(a) Fair.</p> <p>(b) Fair. About half of the candidates were able to demonstrate the use of a checksum. However, weaker candidates did not provide a clear description of the advantages of using a checksum.</p> <p>(c) Fair. About half of the candidates demonstrated an adequate understanding of the contents of the header of a data packet.</p> <p>(d) Poor. Only a very small number of the candidates correctly calculated the total amount of transmitted data and the time required for transmission. Many candidates overlooked the conversions of MB and Mbps in their calculations.</p>

Question Number	Popularity (%)
1	81
2	92
3	83
4	44

Question Number	Performance in General
1	<p>(a) Fair. About half of the candidates were able to state an advantage and disadvantage of using bitmap, but only less than one fifth of the candidates were able to provide a precise description of a scenario in which vector graphics should be preferred for creating images.</p> <p>(b) Satisfactory. More than half of the candidates correctly gave reasons to support the use of the JPG and RAW file formats respectively. However, about half of the candidates were unable to suggest a better method for sharing files, and a few of them incorrectly suggested saving files onto a USB drive and sharing it with friends.</p> <p>(c) Good. Candidates showed a good understanding of the concept of file compression, and about 70% of them correctly estimated the compression ratio. However, only about a third of the candidates realised that some data will be lost due to lossy compression.</p> <p>(d) Fair. About half of the candidates were able to correctly estimate the file size of an uncompressed video and the time required to upload a file with the given bandwidth setting. However, less than 10% of the candidates were aware of the black strips that can appear on a screen due to an inadequate aspect ratio, and the way to rectify this issue.</p>
2	<p>(a) Satisfactory. 40% of the candidates were able to identify that AAC, MP3 and WAV are used for storing audio data only. Weaker candidates incorrectly believed that MP4 is also a type of file used for storing audio data only.</p> <p>(b) Satisfactory. About half of the candidates correctly estimated the file size of the uncompressed audio. However, weaker candidates failed to recognise that the recording is 3 minutes long.</p> <p>(c) Fair. About a third of the candidates were able to give an advantage of using an image file instead of text on a web page. However, only about a quarter of the candidates correctly identified the disadvantages of using an image, such as its inaccessibility for visually impaired people or the inability of search engines to identify its content.</p> <p>(d) Good. More than half of the candidates were able to suggest additional controls when a song is played back. However, weaker candidates were not aware that fast forward and fast backward are the same type of control.</p> <p>(e) Satisfactory. About a quarter of the candidates correctly suggested changes to improve the layout design, while some candidates incorrectly suggested changes that were not related to the layout. Additionally, about three quarters of the candidates were familiar with using filtering, sorting and keyword searching techniques to enhance the efficiency of searching. However, only about a third of the candidates were able to suggest two appropriate changes to make when developing a mobile version.</p>

Question Number	Performance in General
3	<p>(a) Good. The majority of the candidates were able to suggest that the domain could not be registered because it was either already registered or not of the required educational category.</p> <p>(b) Poor. Only a very small number of the candidates demonstrated a clear understanding of the relationships between domains, subdomains, and third-level domains. More than half of the candidates incorrectly answered that <i>onlineticketing.com.hk</i> can be used because the business was located in Hong Kong.</p> <p>(c) Satisfactory. The majority of the candidates were able to provide a clear explanation of how HTTPS can enhance the security of data transfer. However, only about a third of the candidates were able to suggest an application related to the given scenario.</p> <p>(d) Satisfactory. Candidates, in general, were familiar with the usage of text fields, radio buttons, checkboxes and dropdown menus in web page design. However, a few candidates provided irrelevant input controls, such as a calendar, or used data not provided in the given table. About 60% of the candidates were able to suggest useful features of using location services on mobile devices.</p> <p>(e) Fair. About two-thirds of the candidates provided incorrect answers to this question, as they only recited the functions and characteristics of cookies, without explaining the benefits of using cookies on the online ticketing web site.</p> <p>(f) Good. The majority of the candidates demonstrated a good understanding of the accessibility of web site design. However, weaker candidates provided incorrect answers, suggesting the use of ALT-text without realising that the accessibility options should also cater to watching videos.</p>
4	<p>(a) Satisfactory. Candidates demonstrated adequate knowledge of the concept of using client-side and server-side scripts in a dynamic web page. However, only about a third of the candidates were able to clearly explain that toggling is instant, requiring no further action at the server side. About half of the candidates were able to clearly explain that a server is necessary to store and push information to update the counter.</p> <p>(b) Fair. Only a very small number of the candidates correctly identified the type of tweening. Less than a third of the candidates were able to clearly describe how an animation can be created by defining keyframes and automatically generating frames between them. Nevertheless, the majority of the candidates were able to correctly calculate the total number of frames needed to be created given the frame rate.</p> <p>(c) Satisfactory. About a third of the candidates were familiar with script writing and the associated algorithms. However, weaker candidates lacked experience in concatenating two string variables and using a subprogram as a parameter of another subprogram.</p>

Paper 2D

Question Number	Popularity (%)
1	79
2	67
3	86
4	68

Question Number	Performance in General
1	<p>(a) Good. The majority of the candidates were able to correctly determine the basic branching logic in the enqueue function and the proper use of an array in implementing a queue.</p> <p>(b) Good. The majority of the candidates were able to trace the sequential execution of basic queue functions (enq and deq). However, when it came to filling in the code for the implementation of the function deq, only around half of the candidates were able to provide a correct answer within the looping logic (while loop) of the function.</p> <p>(c) Fair. Only about a third of the candidates were able to trace the program with nested logic involving stack and queue operations, as well as the use of a flip function that reverses the order of the items in a stack. Candidates also struggled with back-tracing the input of a program to obtain a given output.</p> <p>(d) Good. About two-thirds of the candidates were able to handle programs with stack and queue operations. Overall, the candidates demonstrated a good understanding of how to reverse stack items using a queue.</p>
2	<p>(a) Very good.</p> <p>(b) Satisfactory. Approximately two-thirds of the candidates were able to provide the correct branching conditions to identify odd/even cases of a given input parameter, as well as determine the correct logic for computing a booth number based on the given row and column numbers of a 2D array. In (b)(ii), around half of the candidates were able to return the row number of a given booth number, demonstrating an adequate understanding in techniques such as integer division and rounding. In (b)(iii), only a quarter of the candidates were able to provide the correct logic for a binary search, suggesting that they were weak in setting the correct looping conditions and updating the left and right boundaries of a binary search.</p> <p>(c) Fair. About a third of the candidates were able to identify the advantages of using low-level languages for software development. They demonstrated an adequate understanding of the role of a linker in program execution.</p> <p>(d) Good.</p>

Question Number	Performance in General
3	<p>(a) Good. Candidates, in general, had comprehensive knowledge of the software development life cycle.</p> <p>(b) Good. Candidates, in general, had comprehensive knowledge of Gantt charts.</p> <p>(c) Fair. Only about a third of the candidates were able to provide the correct branching logic in the function that identifies the index of the maximum value in an array.</p> <p>(d) Good. Candidates, in general, were able to trace the logic of a function that sorts an array and identify the logical fault in the function, and to provide a correction.</p>
4	<p>(a) Very good.</p> <p>(b) Good. However, in (b)(iii), only about a third of the candidates were able to provide a correct generalised input to the function <code>sum</code> in the implementation of the subprogram <code>Zoomout</code>.</p> <p>(c) Satisfactory. About half of the candidates were able to trace a complex algorithm with a nested looping structure and understood the logic and purpose of the given code that prunes unnecessary computation with the use of a given index.</p> <p>(d) Fair. Only about a third of the candidates were able to express the advantage of using a compiler over an interpreter.</p> <p>(e) Good.</p> <p>(f) Fair. Only about a quarter of the candidates were able to express two different advantages of using an object-oriented language over a procedural language.</p>

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