

Briefing Session on 2025 HKDSE ICT

31 Oct 2025



Rundown

1. Introduction
2. Paper 1A
3. Paper 1B
4. Paper 2A
5. Break
6. Paper 2B
7. Paper 2C
8. Q&A



Admission Requirements and Bonuses of ICT 2026

University	ICT Bonus (No. of programs)	ICT Required (No. of programs)	Remark
CUHK	14	6	Computing, Engineering, Science, Finance, Education https://www.cuhk.edu.hk/eng/academic/programs/2025/2025-26/2025-26%20Admission%20Information%202025.pdf
HKU	4	5	Computing, AI, InnoTech, Business https://admissions.hku.hk/en/admission/2025-26/2025-26%20Admission%20Information%202025.pdf
HKUST	8	10	Phy x 2, ICT x 1.5 for all Computing & Engineering https://admissions.hkust.hk/en/2025-26/2025-26%20Admission%20Information%202025.pdf
CityU	6	NA	Computing, Engineering, Biomedical Science https://www.cityu.edu.hk/admission/default.htm?2025-26/2025-26%20Admission%20Information%202025.pdf
PolyU	~ 20	NA	Computing, Engineering, AI, Science, Aviation, Media, Finance, Linguistics https://admissions.polyu.edu.hk/en/admission/2025-26/2025-26%20Admission%20Information%202025.pdf
EduHK	7	3	ICT & AI Edu, EduTech, Digital Communication https://www.edu.hk/en/academic/programs/2025-26/2025-26%20Admission%20Information%202025.pdf
HKBU	0	0	No weighting for all electives for School of Science / Creative Media https://admissions.hkbu.edu.hk/en/admission/2025-26/2025-26%20Admission%20Information%202025.pdf
Lingnan	10	NA	Business, Data Science, Multimedia https://www.ln.edu.hk/admission/2025-26/2025-26%20Admission%20Information%202025.pdf

Reference: https://dse.bigexam.hk/en/dseIntro/cateA/cateAsubj/SJ_IAC & <https://www.jupas.edu.hk/en/>



Recent Changes in C&A (1)

Exam Year	C&A changes
2018 Exam	SBA: Two guided tasks
2019 Exam	Minor curriculum change Core Part: Programming (20 → 24 hrs)
2025 Exam	Major curriculum change Core Part: Programming (24 → 48 hrs) Elective Part: Choose 2 out of 3 options



Recent Changes in C&A (2)

- Updated SBA Teachers' Handbook regarding the use of AI tools in SBA
 - Discussion on the use of AI tools with students
 - Declaration
 - Properly acknowledged



2025 ICT Assessment Framework

- Weighting & exam time remain unchanged
- Paper 1: MC Qu 22%
 Short Qu & Structured Qu 33%
- Paper 2: Choose 2 out of 3 options
 @option - **Short Qu** & Structured Qu 25%
- SBA: 20%
- Python, C++, **Pascal** (Appendix 3, C&A guide)
- Choosing options at exam, not at registration
- Paper 2 – **Answer book (B)**; Paper 1B – QA book
(Refer to 2025 Sample paper)



Curriculum Framework of senior secondary ICT

The Compulsory Part (144 hours)			
A. Information Processing	(37 hours)	B. Computer System Fundamentals	(20 hours)
C. Internet and its Applications	(31 hours)	D. Computational Thinking and Programming	(48 hours)
E. Social Implications	(8 hours)		

Programming questions in pseudocode/ program code)



+



+

School-based Assessment
(30 hours)

The Elective Part (76 hours) (Choose any two)		
A. <i>Databases</i>	B. <i>Web Application Development</i>	C. <i>Algorithm and Programming</i>



Exam Statistics



Breakdown of Elective Part

- Total no. of candidates sat: 6,280

Paper	Sat (C)	Sat (E)	Total
1	3387	2885	6272
2A	2990	2608	5598 (89%)
2B	1325	727	2052 (33%)
2C	2332	2389	4721 (75%)



Results of ICT (all candidates)

Lev	2017	2018	2019	2020	2021	2022	2023	2024	2025
5**	0.9	0.8	0.9	0.9	1.1	1.1	1.3	1.3	1.4
5*+	3.6	3.2	3.8	3.5	4.1	4.2	4.9	5.1	5.1
5+	8.9	8.1	9.7	8.7	10.0	10.4	12.2	12.7	12.8
4+	27.2	27.3	30.1	28.0	30.0	28.7	32.7	32.8	33.6
3+	52.2	53.3	54.7	52.9	54.1	53.0	55.5	58.6	60.2
2+	80.3	81.9	82.7	80.6	81.1	80.6	81.6	85.5	85.6
1+	94.1	95.0	94.8	94.2	93.8	93.4	93.6	94.8	94.7

Note: L5** Around Top 10% of L5
 L5*+ Around Top 40% of L5 (L5* = next 30%)



Marking (1)

- Quality control: standardisation, checkmarking, control scripts, etc.
- Marking
 - Accept common abbreviations (Terms in C&A Guide, the Glossary, etc.)
e.g. 'DHCP server' in Paper 2, Q.8(b) ✓
 - Answers not written in the language medium entered would not be marked



Marking (2)

- Marking schemes
 - Marking guidelines agreed after standardisation (after checking 100-300 scripts)
 - may not exhaust all possible answers
 - professional discretion and judgment in accepting alternative answers (correct and well-reasoned)



2025 ICT Samples of Candidates' Performance

- Two samples @ Level @ language version
- Paper 2: samples from different options, when appropriate
- Available in HKEAA web site

https://www.hkeaa.edu.hk/en/hkdse/assessment/subject_information/category_a_subjects/hkdse_subj.html?A2&2&16



Performance – Compulsory Part

- Average no. of MC items correct = 28
- High correlation with Paper 2A, 2B, 2C



Performance – Elective Part

- Equating – performance of candidates (Elective Part) can be reflected on the same scale (Equipercntile method*)
- Performance of students (Paper 1):
 $2C > 2A > 2B$

** Refer to Grading Procedures & standards
-referenced Reporting in the HKDSE Exam (HKEAA)*



Exam irregularities (1)

- Paper 2 - Answer Book (B)
 - Write ALL Question No. on the cover pages
 - Start each question on a new page
 - Put 'X' in the corresponding question number box on each page
 - 1 Question on 1 page



Answer Book (1)

- For Paper 2 (Question Book)
- DSE (B) - 16 pages (15 blank pages)

	2024 DSE (B)	請在此貼上電腦條碼 Please stick the barcode label here.										
香港考試及評核局 HONG KONG EXAMINATIONS AND ASSESSMENT AUTHORITY												
香港中學文憑考試 HONG KONG DIPLOMA OF SECONDARY EDUCATION EXAMINATION												
答題簿 ANSWER BOOK		<table border="1"><tr><td>考生編號 Candidate Number</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>	考生編號 Candidate Number									
考生編號 Candidate Number												
考生須知 (一) 宣布開考後，考生須首先在第 1 頁之適當位置填寫考生編號，並在第 1、3、5 及 7 頁之適當位置貼上電腦條碼。		<table border="1"><tr><td>由考生填寫 To be filled in by the candidate</td></tr></table>	由考生填寫 To be filled in by the candidate									
由考生填寫 To be filled in by the candidate												

Exam irregularities

> 300 irregularity cases

- WRONG / NO / many 'X' symbols
- Answers of two or more questions on a page

試題編號 Question No.												
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

每題另起新頁作答。

Start each question on a new page.



Paper 1A

In general, candidates performed well in programming questions.



Question 9 aimed to assess candidates' understanding of common file formats, specifically PDF and HTML. Half of the candidates were able to demonstrate an understanding of the advantages of PDF over HTML. However, some candidates selected options that clearly favored the HTML format in applications, indicating a lack of comprehension regarding the significance of HTML in web contexts.

- Q.9 John publishes an article on the Internet. He considers using PDF instead of HTML because
- A. a browser can be used to open the article. (9%)
 - B. multimedia elements can be added to the article. (19%)
 - C. the file size is smaller. (20%)
 - * D. it offers better document protection. (52%)

Question 12 aimed to assess candidates' knowledge of operating system functions. Fewer than half of the candidates answered correctly, though approximately two thirds of the candidates recognised that system security is a core function of an operating system.

Q.12 Which of the following are the functions of an operating system?

- (1) Managing input and output devices.
 - (2) Managing system security.
 - (3) Managing computer's memory.
-
- A. (1) and (2) only (10%)
 - B. (1) and (3) only (36%)
 - C. (2) and (3) only (9%)
 - * D. (1), (2) and (3) (45%)

Question 18 aimed to assess candidates' basic understanding of IPv4 addresses. Fewer than half of the candidates were able to identify that each number in an IP address is an integer ranging from 0 to 255, a fundamental aspect of network management. This concept, alongside the distinction between the network and host portions, is crucial for grasping the IPv4 structure. The results showed that the majority of the candidates did not fully understand the representation of IP addresses.

Q.18 Which of the following is/are valid IPv4 address(es)?

- (1) 10.512.10.0
- (2) 1.2.3.4
- (3) 192.168.1.256

- A. (1) only (6%)
- * B. (2) only (44%)
- C. (1) and (3) only (23%)
- D. (2) and (3) only (27%)

Question 24 aimed to assess candidates' ability to integrate knowledge of TCP/IP applications. Half of the candidates understood IP routing. The other candidates erroneously assumed that IP routing involved fixed paths, which relates to circuit switching rather than packet switching.

Q.24 Which of the following statements about transmitting data using TCP/IP are correct?

- (1) An IP address is used to identify a device in a network.
- (2) Data packets are reassembled back to the original data at the destination.
- (3) The IP determines a fixed path to send data packets to the specific destination.

- * A. (1) and (2) only (49%)
- B. (1) and (3) only (9%)
- C. (2) and (3) only (16%)
- D. (1), (2) and (3) (26%)

Question 38 aimed to assess candidates' ability to use conditional loops to solve problems. 65% of candidates answered the question correctly. The remaining candidates might trace the conditional increments incorrectly, particularly in odd/even handling.

Q.38 What is the output of the following algorithm?

```
S ← 0
A ← 3
while A ≤ 9
    S ← S + A
    if (the remainder of (A/2)) = 1
        A ← A + 1
    else
        A ← 2 * A + 1
output S
```

- | | |
|---------|-------|
| A. 7 | (14%) |
| B. 9 | (5%) |
| C. 10 | (16%) |
| * D. 16 | (65%) |

Paper 1B, 2A, 2B, 2C



Excellent

Good

Satisfactory

Fair

Poor



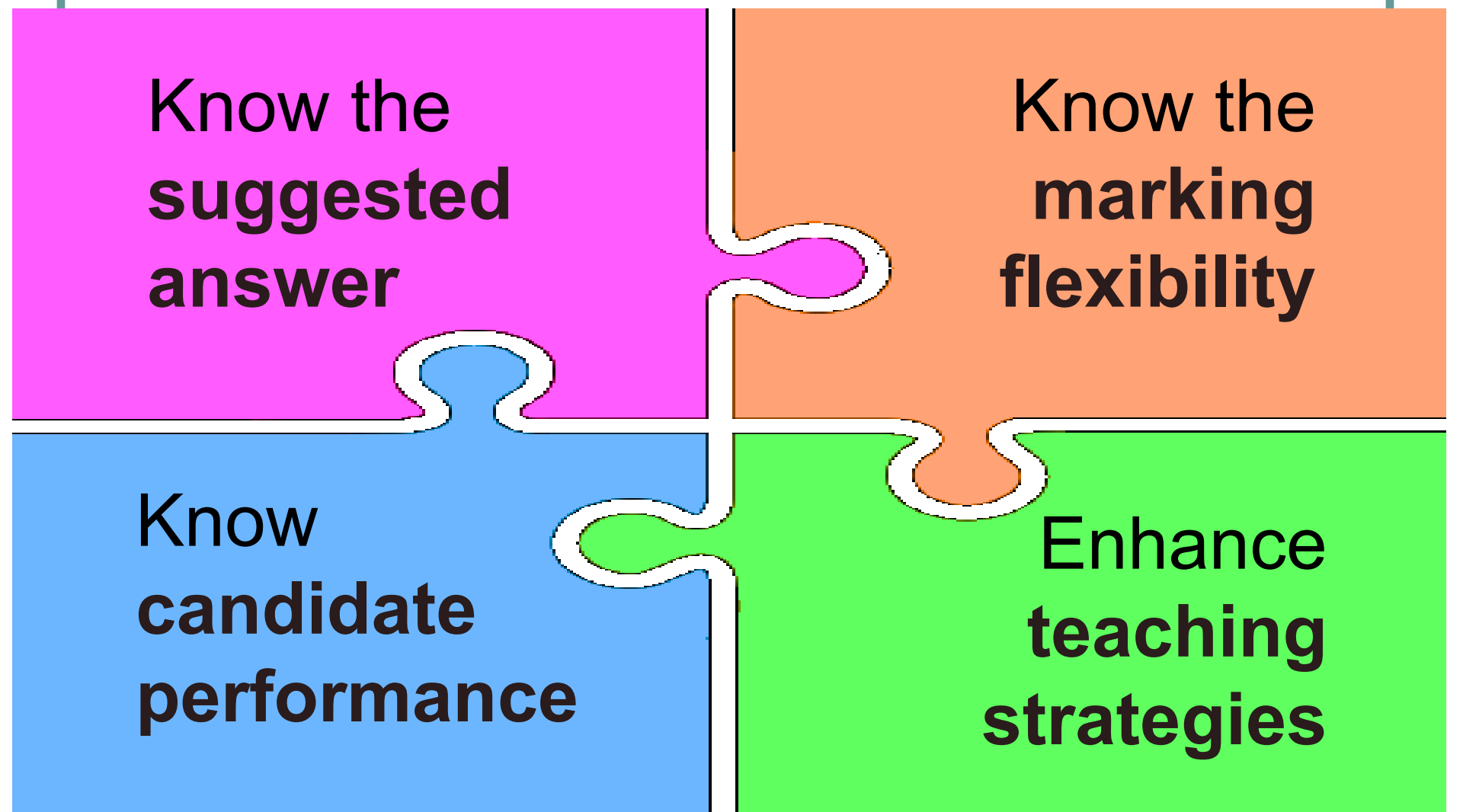
HKDSE ICT 2025

Exam paper marking review
(Paper 1B Q1 – 5 & 7)

Marking guideline

- Fairness
 - Marker not do GUESS of student answer
- Professional
 - As students are studying ICT,
 - Answer should be more technical / professional
- Others
 - Not accept too general answer
 - Not accept answer seems direct copy from qu

Function of marking review



The diagram consists of four interlocking puzzle pieces arranged in a 2x2 grid. Each piece has a white border and contains text in a bold, black, sans-serif font. The top-left piece is pink, the top-right is orange, the bottom-left is blue, and the bottom-right is green. The pieces are interlocked such that the top-left piece fits into the top-right, the top-right into the bottom-right, the bottom-right into the bottom-left, and the bottom-left into the top-left.

**Know the
suggested
answer**

**Know the
marking
flexibility**

**Know
candidate
performance**

**Enhance
teaching
strategies**

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Paper 1B Qu 1 – Spreadsheet

Q1

1. Ms Ng uses a spreadsheet to store the student marks in three tests, as shown below:

	A	B	C	D	E	F	G	H
1	Class number	Name	Test 1 mark	Test 2 mark	Test 3 mark	Average mark	Average mark less than or equal to	Number of students
2	1	Au Chi Man	65	88	45	66.0	30	1
3	2	Chan Ka Ka	37	20	29	28.7	50	4
4	3	Chan Wing Hong	88	60	90	79.3	75	22
5	4	Chan Yi Ling	70	45	97	70.7	90	30
6	5	Cheng Wai	61	66	56	61.0	100	35
7	6	Chow Pui Pui	53	80	87	73.3		
8	7	Ho Ting Ka	85	99	98	94.0		
35	34	Yip Fung	36	98	45	59.7		
36	35	Yip Ka Fai	55	80	30	55.0		

- (a) To calculate the average mark of students in the three tests, a formula is entered into F2 and then copied to F3:F36. Write the formula in F2. (1 mark)
-
- (b) To store the numbers of students who scored less than or equal to 30, 50, 75, 90 and 100 marks in H2:H6, a formula is entered into H2 and then copied to H3:H6. Write the formula in H2. (3 marks)

1B Qu 1a – Spreadsheet

To calculate the average mark of students in the three tests, a formula is entered into F2 and then copied to F3:F36. Write the formula in F2.

	A	B	C	D	E	F	G	H
1	Class number	Name	Test 1 mark	Test 2 mark	Test 3 mark	Average mark	Average mark less than or equal to	Number of students
2	1	Au Chi Man	65	88	45	66.0	30	1
3	2	Chan Ka Ka	37	20	29	28.7	50	4
4	3	Chan Wing Hong	88	60	90	79.3	75	22
5	4	Chan Yi Ling	70	45	97	70.7	90	30
6	5	Cheng Wai	61	66	56	61.0	100	35
7	6	Chow Pui Pui	53	80	87	73.3		
8	7	Ho Ting Ka	85	99	98	94.0		
	⋮							
35	34	Yip Fung	36	98	45	59.7		
36	35	Yip Ka Fai	55	80	30	55.0		

1B Qu 1a – Spreadsheet

- `=AVERAGE($C2:$E2)`

	A	B	C	D	E	F	G	H
1	Class number	Name	Test 1 mark	Test 2 mark	Test 3 mark	Average mark	Average mark less than or equal to	Number of students
2	1	Au Chi Man	65	88	45	66.0	30	1
3	2	Chan Ka Ka	37	20	29	28.7	50	4
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5	4	Chan Yi Ling	70	45	97	70.7	90	30
6	5	Cheng Wai	61	66	56	61.0	100	35
7	6	Chow Pui Pui	53	80	87	73.3		
8	7	Ho Ting Ka	85	99	98	94.0		

⋮

35	34	Yip Fung	36	98	45	59.7		
36	35	Yip Ka Fai	55	80	30	55.0		

- `AVERAGE(C2:E2)`

1B Qu 1a – Spreadsheet

Know the marking flexibility

- AVERAGE(C2:E2)

=AVERAGE(C2:E2)

- Not case sensitive
- AVG → X
- Spelling mistake → X

1B Qu 1a – Spreadsheet

Know the marking flexibility

- AVERAGE(C2:E2)
- Use other reasonable calculation method but lead to same result
 - (like $\text{sum} / \text{count}$; $\text{sum} / 3$; $(.++.+)/3$)
- Care about : 「 = 」 Sign

1B Qu 1a – Spreadsheet

- (a) 為了計算學生在三次測驗的平均分，
F2 的公式。

$$= \text{AVG}(\$C3 : \$E3)$$

	A	B	C	D	E	F	G	H
1	Class number	Name	Test 1 mark	Test 2 mark	Test 3 mark	Average mark	Average mark less than or equal to	Number of students
2	1	Au Chi Man	65	88	45	66.0	30	1
3	2	Chan Ka Ka	37	20	29	28.7	50	4
4	3	Chan Wing Hong	88	60	90	79.3	75	22
5	4	Chan Yi Ling	70	45	97	70.7	90	30
6	5	Cheng Wai	61	66	56	61.0	100	35
7	6	Chow Pui Pui	53	80	87	73.3		
8	7	Ho Ting Ka	85	99	98	94.0		
35	34	Yip Fung	36	98	45	59.7		
36	35	Yip Ka Fai	55	80	30	55.0		

- (a) 為了計算學生在三次測驗的平均分，在 F2 輸入
F2 的公式。

$$(\$C\$2 + \$C\$3 + \$C\$4) / 3$$

1B Qu 1a – Spreadsheet

- (a) 為了計算學生在三次測驗的平均分，在 F2 的公式。

$$=Avg(\$C\$2:\$E\$2)$$

	A	B	C	D	E	F	G	H
1	Class number	Name	Test 1 mark	Test 2 mark	Test 3 mark	Average mark	Average mark less than or equal to	Number of students
2	1	Au Chi Man	65	88	45	66.0	30	1
3	2	Chan Ka Ka	37	20	29	28.7	50	4
4	3	Chan Wing Hong	88	60	90	79.3	75	22
5	4	Chan Yi Ling	70	45	97	70.7	90	30
6	5	Cheng Wai	61	66	56	61.0	100	35
7	6	Chow Pui Pui	53	80	87	73.3		
8	7	Ho Ting Ka	85	99	98	94.0		
35	34	Yip Fung	36	98	45	59.7		
36	35	Yip Ka Fai	55	80	30	55.0		

- (a) To calculate the average mark of students is copied to F3:F36. Write the formula in F2

$$= (\$C2 + \$D2 + \$E2) / 3$$

1

1B Qu 1a – Spreadsheet

- Satisfactory

A common error was using 'AVG' instead of the appropriate function name.

1B Qu 1a – Spreadsheet

- AVG vs AVERAGE
 - Qu having the use of both @ the same time
- Absolute addressing
- Exam (mark) vs practical use

1B Qu 1b – Spreadsheet

To store the numbers of students who scored less than or equal to 30, 50, 75, 90 and 100 marks in H2:H6, a formula is entered into H2 and then copied to H3:H6. Write the formula in H2.

	A	B	C	D	E	F	G	H
1	Class number	Name	Test 1 mark	Test 2 mark	Test 3 mark	Average mark	Average mark less than or equal to	Number of students
2	1	Au Chi Man	65	88	45	66.0	30	1
3	2	Chan Ka Ka	37	20	29	28.7	50	4
4	3	Chan Wing Hong	88	60	90	79.3	75	22
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6	5	Cheng Wai	61	66	56	61.0	100	35
7	6	Chow Pui Pui	53	80	87	73.3		
8	7	Ho Ting Ka	85	99	98	94.0		
35	34	Yip Fung	36	98	45	59.7		
36	35	Yip Ka Fai	55	80	30	55.0		

1B Qu 1b – Spreadsheet

● = COUNTIF (\$F\$2:\$F\$36 , "<="&G2)

	A	B	C	D	E	F	G	H
1	Class number	Name	Test 1 mark	Test 2 mark	Test 3 mark	Average mark	Average mark less than or equal to	Number of students
2	1	Au Chi Man	65	88	45	66.0	30	1
3	2	Chan Ka Ka	37	20	29	28.7	50	4
4	3	Chan Wing Hong	88	60	90	79.3	75	22
5	4	Chan Yi Ling	70	45	97	70.7	90	30
6	5	Cheng Wai	61	66	56	61.0	100	35
7	6	Chow Pui Pui	53	80	87	73.3		
8	7	Ho Ting Ka	85	99	98	94.0		
	:							
35	34	Yip Fung	36	98	45	59.7		
36	35	Yip Ka Fai	55	80	30	55.0		

● COUNTIF (F\$2: F\$36 , "<="&G2)

1B Qu 1b – Spreadsheet

● = COUNTIF (\$F\$2:\$F\$36 , "<="&G2)

	A	B	C	D	E	F	G	H
1	Class number	Name	Test 1 mark	Test 2 mark	Test 3 mark	Average mark	Average mark less than or equal to	Number of students
2	1	Au Chi Man	65	88	45	66.0	30	1
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6	5	Cheng Wai	61	66	56	61.0	100	35
7	6	Chow Pui Pui	53	80	87	73.3		
8	7	Ho Ting Ka	85	99	98	94.0		
	⋮							
35	34	Yip Fung	36	98	45	59.7		
36	35	Yip Ka Fai	55	80	30	55.0		

● COUNTIF (F\$2: F\$36 , "<="&G2)

1B Qu 1b – Spreadsheet

Know the marking flexibility

- **For "<="&G2**
 - **Accept** : '.....' or "....."
 - **Not accept** : not have &

1B Qu 1b – Spreadsheet

- (b) To store the numbers of students who scored less than or equal to the average mark in H2:H6, a formula is entered into H2 and then copied to

= countif (\$F\$2: \$F\$36 , '<= ' & \$G2)

1 1 1

	A	B	C	D	E	F	G	H
1	Class number	Name	Test 1 mark	Test 2 mark	Test 3 mark	Average mark	Average mark less than or equal to	Number of students
2	1	Au Chi Man	65	88	45	66.0	30	1
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4	3	Chan Wing Hong	88	60	90	79.3	75	22
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7	6	Chow Pui Pui	53	80	87	73.3		
8	7	Ho Ting Ka	85	99	98	94.0		
35	34	Yip Fung	36	98	45	59.7		
36	35	Yip Ka Fai	55	80	30	55.0		

1B Qu 1b – Spreadsheet

✓

- (b) To store the numbers of students who scored less than or equal to 30, 5 in H2:H6, a formula is entered into H2 and then copied to H3:H6. Write

_____ = Countif (F\$2: F\$36 , <= G2)

1

1

	A	B	C	D	E	F	G	H
1	Class number	Name	Test 1 mark	Test 2 mark	Test 3 mark	Average mark	Average mark less than or equal to	Number of students
2	1	Au Chi Man	65	88	45	66.0	30	1
3	2	Chan Ka Ka	37	20	29	28.7	50	4
4	3	Chan Wing Hong	88	60	90	79.3	75	22
5	4	Chan Yi Ling	70	45	97	70.7	90	30
6	5	Cheng Wai	61	66	56	61.0	100	35
7	6	Chow Pui Pui	53	80	87	73.3		
8	7	Ho Ting Ka	85	99	98	94.0		
35	34	Yip Fung	36	98	45	59.7		
36	35	Yip Ka Fai	55	80	30	55.0		

1B Qu 1b – Spreadsheet

- (b) To store the numbers of students who scored less than or equal to 30, 50, 75 in H2:H6, a formula is entered into H2 and then copied to H3:H6. Write the formula.

=COUNTIF("G2:G35", <="G2")

1

	A	B	C	D	E	F	G	H
1	Class number	Name	Test 1 mark	Test 2 mark	Test 3 mark	Average mark	Average mark less than or equal to	Number of students
2	1	Au Chi Man	65	88	45	66.0	30	1
3	2	Chan Ka Ka	37	20	29	28.7	50	4
4	3	Chan Wing Hong	88	60	90	79.3	75	22
5	4	Chan Yi Ling	70	45	97	70.7	90	30
6	5	Cheng Wai	61	66	56	61.0	100	35
7	6	Chow Pui Pui	53	80	87	73.3		
8	7	Ho Ting Ka	85	99	98	94.0		
35	34	Yip Fung	36	98	45	59.7		
36	35	Yip Ka Fai	55	80	30	55.0		

1B Qu 1b – Spreadsheet

- Fair
- "<="&G2
 - using the '&' operator to combine comparison operators with cell addresses in the parameters

1B Qu 1b – Spreadsheet

- Questions with more than 1 mark
 - 1st mark → easy to get
 - 2nd mark → harder
 - 3rd mark → most difficult
- Check students' understand at different levels of knowledge

1B Qu 2a – Threats and Security

When Eva logs on to a computer system, she will receive a one-time password for authentication. Give two characteristics of a one-time password.

1B Qu 2a – Threats and Security

Know the **suggested answer**

- The password has a **timestamp** (valid for a short period of time).
- The password **cannot be reused**.
- The password is sent through **other channels** such as SMS, email, tokens, and mobile app.

1B Qu 2a – Threats and Security

Know the **suggested answer**

Mark by category :

- **Lifespan of the code**
- **Cannot be reused**
- **Sent through another channel**

**Any 2
cat.**

1B Qu 2a – Threats and Security

Know the **marking flexibility**

- With similar wording, showing having the idea

1B Qu 2a – Threats and Security

密碼的兩項特徵。



(2 分)

一次性密碼只能使用一次和大部份都是由六個數字組成



一個密碼只能使用一次

一次性密碼是隨機生成的



1B Qu 2a – Threats and Security



· It has time limit that the password can be used.

· It is different everytime



1B Qu 2a – Threats and Security

- Satisfactory
- Showing students' understanding still at common-sense level ?

1B Qu 2a – Threats and Security

Enhance teaching strategies

- Why teach / learn ICT
 - From common sense to professional understanding
 - Then to application
 - With ethics

1B Qu 2a – Threats and Security

Enhance teaching strategies

2.2 Learning Objectives and Outcomes

During the three-year senior secondary ICT curriculum, students work towards the following learning targets in the categories of “Knowledge and Understanding”, “Skills” and “Values and Attitudes”.

Knowledge and Understanding

- Develop knowledge and understanding of the range and organisation of computer systems, and the interrelationships between hardware, software and data; and
- Realise the social, ethical and legal issues pertaining to the use of ICT.

1B Qu 2a – Threats and Security

Enhance teaching strategies

Skills

- Use a range of applications software effectively, ethically and with discrimination to support information processing and problem-solving; and
- Demonstrate an understanding of methods for analysing problems, and planning and implementing solutions using ICT.

Values and Attitudes

- Appreciate how information literacy and the sharing of knowledge using ICT influence decision-making and shape our society; and
- Develop responsible and positive attitudes towards the use of ICT.

1B Qu 2b – Threats and Security

Eva sends a document file to Paul.
Describe how they use PKI to ensure that only Paul can open and read the file.

1B Qu 2b – Threats and Security

Know the **suggested answer**

- Eva 小芬 encrypts the file using Paul's 志强 public key
- and Paul 志强 decrypts the received file by his private key.

1B Qu 2b – Threats and Security

Know the suggested answer

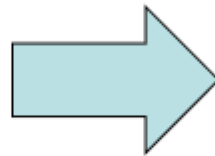
- **Eva** 小芬 **encrypts** the file using **Paul's** 志强 **public** key
- and **Paul** 志强 **decrypts** the received file by **his** **private** key.

1B Qu 2b – Threats and Security

Know the **suggested answer**

- **Eva** 小芬
- **encrypts** the file
- using **Paul** 志強's
- **public key**

1



- **Paul** 志強
- **decrypts** the file
- using **his**
- **private key**

1

1B Qu 2b – Threats and Security

Know the **suggested answer**

- **WHOSE** Key + **WHICH** Key

1B Qu 2b – Threats and Security

Know the marking flexibility

- No flexibility
- This time is good as both person involved are different gender
 - → his / her → who ???

1B Qu 2b – Threats and Security

Know the marking flexibility

2024 QU 3 (b)

WHOSE Key + WHICH Key

- Ada uses ... **1**
 - Ada's private key
 - her private key
 - 小麗的私人密碼匙
 - 她的私人密碼匙
 - 她的私匙

- Then Bob uses ... **1**
 - Ada's public key
 - her public key
 - 小麗的公開密碼匙
 - 她的公開密碼匙
 - 她的公匙

1B Qu 2b – Threats and Security

Know the marking flexibility

2025 QU 2 (b)

WHOSE Key + WHICH Key

- Eva uses ... **1**
 - Paul's public key ✓
 - his' public key ✓
 - 志強的公開密碼匙 ✓
 - 他的公開密碼匙 ✗
 - 他的公匙 ✗
- Then Paul uses ... **1**
 - Paul's private key ✓
 - his private key ✓
 - 志強的私人密碼匙 ✓
 - 他的私人密碼匙 ✓
 - 他的私匙 ✓

1B Qu 2b – Threats and Security



小芳以志強的 公開密碼是作為加密, 這樣
只有志強能用自已的私人鑰匙解密並開啟此檔案。



1B Qu 2b – Threats and Security



小芳使用公匙傳送檔案給志強，
而志強則利用私匙開啟及閱讀檔案。



1B Qu 2b – Threats and Security

2025 QU 2 (b)

- Satisfactory

- omitted

- specifying who performs the encryption / decryption or
- who owns the cryptographic key.

WHOSE Key + WHICH Key

- | | |
|-----------------------------|-----------------------------------|
| • Eva uses ... ¹ | • Then Paul uses ... ¹ |
| – Paul's public key ✓ | – Paul's private key ✓ |
| – his' public key ✓ | – his private key ✓ |
| – 志強的公開密碼匙 ✓ | – 志強的私人密碼匙 ✓ |
| – 他的公開密碼匙 ✗ | – 他的私人密碼匙 ✓ |
| – 他的公匙 ✗ | – 他的私匙 ✓ |

1B Qu 2b – Threats and Security

Enhance teaching strategies

- PKI happened in DSE ICT for many times. Marking will be more and more strict and questions will be more and more tricky
- → need more tricky practices

1B Qu 3 – Computer Systems

Amy uses her mobile phone to take photos during a study tour. She uploads the photos to the Internet to share them with her classmates

1B Qu 3a – Computer Systems

Suppose that the size of each photo is 5MB and the bandwidth for the upload is 100Mbps. Estimate the shortest time required to upload 200 photos. Show your calculation.

1B Qu 3a – Computer Systems

Suppose that the size of each photo is 5MB and the bandwidth for the upload is 100Mbps. **Estimate** the shortest time required to upload 200 photos. **Show your calculation.**

1B Qu 3a – Computer Systems

Know the **suggested answer**

- $(200 \times 5 \times 8) / 100 = 80 \text{ s}$

1B Qu 3a – Computer Systems

- $(200 \times 5 \times 8) / 100 = 80 \text{ s}$

Step → 1 mark **Answer** (must have unit) → 1 mark

Estimate → not show 1024 or 1000 → OK

File size → 1024 or 1000 both OK

Bandwidth → must be 1000, cannot be 1024

1B Qu 3a – Computer Systems

Know the marking flexibility

- $$\frac{200 \times 1024 \times 1024 \times 5 \times 8}{100 \times 1000 \times 1000}$$

- = 84 s (83.89)

- $$(200 \times 1024 \times 5 \times 8) / (100 \times 1000)$$

- = 82 s (81.92)

1B Qu 3a – Computer Systems

Know the marking flexibility

- $(200 \times 5 \times 8) / 100 = 80 \text{ s}$
- Not accept :
 - without unit
 - bandwidth used 1024

1B Qu 3a – Computer Systems

$$\frac{200(5 \times 1024 \times 1024 \times 8)}{(100 \times 1000 \times 1000)}$$



$$\approx 83.9 \text{ s}$$



$$\frac{100 \times 5 \text{ MB}}{100 \text{ Mbps}} = 10 \text{ s}$$



1B Qu 3a – Computer Systems

$$\frac{5 \times 1024 \times 1024 \times 8 \times 200}{1 \times 1000 \times 1000 \times 8} \quad \times$$

$$= 1048.576 \text{ 秒}$$

$$= 17.48 \text{ 分鐘} \quad \times$$

1B Qu 3a – Computer Systems

- Fair
- Frequent errors included
 - failing to convert bytes to bits ($1\text{B} = 8\text{b}$) or
 - neglecting to include the unit (seconds).

1B Qu 3a – Computer Systems

Enhance teaching strategies

- Seems basic type of questions
- Need more practices
 - Especially need to have
 - B vs b
 - Storage vs bandwidth
 - unit

1B Qu 3b(i) – Networking & Internet Basics

Amy sends her classmates the following email for them to download a zip file

Hi Classmates,

Please click the following link to download the photos:

<http://www.hkedcity.net/ihouse/Amy2504/photos.zip>

Amy

(i) Amy finds that the following URL in a browser also results in downloading the same file. Why?

<http://202.8.88.24/ihouse/Amy2504/photos.zip>

1B Qu 3b(i) – Networking & Internet Basics

Know the **suggested answer**

- www.hkedcity.net is the domain name of the web server with the IP address 202.8.88.24. /
- The web site and the IP address refer to the same server.

Know the marking flexibility

- Accept
 - It is a mirror site of the website

1B Qu 3b(i) – Networking & Internet Basics

<http://202.8.88.24/ihouse/Amy2504/photos.zip>



因為只是把www.hkedcity.net轉成202.8.88.24



因為跟她的連結相同

Amy forgot to add "s" in http



1B Qu 3b(i) – Networking & Internet Basics

<http://202.8.88.24/ihouse/Amy2504/photos.zip>

Because the DNS server translates "hkedcity.net" to the corresponding IP.



現時於瀏覽器內輸入以下 URL 也可下載同一個檔案。

<http://202.8.88.24/ihouse/Amy2504/photos.zip>

202.8.88.24 與 www.hkedcity.net 互通



1B Qu 3b(i) – Networking & Internet Basics

- Fair
- Students know two URLs were the same but cannot do elaboration clearly

Enhance teaching strategies

- Training on technical explanation

1B Qu 3b(ii) – Networking & Internet Basics

Give an advantage of using an attachment over a hyperlink to send the file

1B Qu 3b(ii) – Networking & Internet Basics

Know the **suggested answer**

- Make sure file sent / received is not altered after the email has been sent out

Know the marking flexibility

- **Accept (need to have elaboration):**
 - More Secure as by URL may have risk if link is leaked and security setting of link is not setting in good condition
 - Can always be downloaded by recipient while link can be invalid if owner changed the setting

1B Qu 3b(ii) – Networking & Internet Basics

3 使用附件勝於超連結傳送此檔案的一個優點。

(1 分)



附件可直接點入即查看，縮短打開檔案的時間

4 使用附件勝於超連結傳送此檔案的一個優點。

不用打開瀏覽器也能下載此檔案



1B Qu 3b(ii) – Networking & Internet Basics

The file can be shown ~~no~~ matter the hyperlink is out of service. ✓

Multiple files can be attached in an attachment whereas only one file can be attached per hyperlink. ✗

1B Qu 3b(ii) – Networking & Internet Basics

- Fair
- unclear about the operational differences between downloading a file via a link and an email attachment.

1B Qu 3b(ii) – Networking & Internet Basics

- Fair
- Most of the comparison focus by students :
 - Time for opening a file
 - Preview of file

Enhance teaching strategies

- In fact, submitted file instead of URL is common in competition. Can use this as an example to explain the rationale behind.

1B Qu 4a(i) – Elementary Web Authoring

Mary's company web site shows a photo with its original resolution of 800 x 600. She changes the HTML code to make the displayed size of the photo become 400 x 200

After the change of HTML code,

(i) Will the download time of the photo be shorter? Why?

1B Qu 4a(i) – Elementary Web Authoring

Know the suggested answer

- No, the same photo will be downloaded.

Know the marking flexibility

- With similar wording, showing having the idea

1B Qu 4a(i) – Elementary Web Authoring

(i) Will the download time of the photo be shorter? Why?



(1 mark)

Yes the ~~the~~ download time will be shorter because decrease in resolution results in decrease in file size resulting in faster download time.

(i) 相片下載時間會否縮短？為什麼？



因為相片大小變小了，所以相片檔案也會跟着變小

1B Qu 4a(i) – Elementary Web Authoring

- Poor
- demonstrated a limited understanding of HTML code application
 - particularly in distinguishing between display size and file size

Enhance teaching strategies

- In practicing web authoring, mention the changes in all aspects when changing the parameters
- Try use some extreme cases as demo

1B Qu 4a(ii) – Elementary Web Authoring

Will the photo displayed be distorted?
Why?

1B Qu 4a(ii) – Elementary Web Authoring

Know the **suggested answer**

- Yes, it is because the aspect ratio is changed from 4:3 to 2:1.

Know the marking flexibility

- Yes, it is because the aspect ratio is changed from 4:3 to 2:1.

1B Qu 4a(ii) – Elementary Web Authoring

(ii) 所顯示的相片會否失真？為什麼？



不會，因相片不會因檔案的大小而失真

(ii) 所顯示的相片會否失真？為什麼？



會，因為像素數低是會無法清晰顯示。

1B Qu 4a(ii) – Elementary Web Authoring

- Poor
- Not much can clearly & accurately described the impact of changes to the photo's aspect ratio
 - But in fact, it is obvious in the question statement

Enhance teaching strategies

- Aspect ratio is not a big topic and so teaching time mostly not much on that. May need to have it (also other similar knowledge) in assessment
 - (assessment for learning)
 - (assessment as learning)

Enhance teaching strategies

- Students not understand the word
“Distorted / 失真”

1B Qu 4b – Technological Innovations

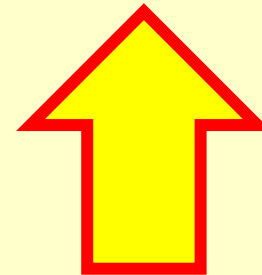
Learning Outcomes	Remarks
Understand the basic concepts of technological innovations and its applications.	Examples include pattern recognition through artificial intelligence (AI) and data science, 3D printing technologies, augmented reality (AR) and virtual reality (VR). Students should have practical experience with these technologies.

1B Qu 4b – Technological Innovations

Mary installs an AI system with cameras in a country park to detect fires. She needs to choose photo samples to train the AI Systems. Give Two considerations that Mary should take into account for this.

1B Qu 4b – Technological Innovations

Learning Outcomes	Remarks
Understand the basic concepts of technological innovations and its applications.	Examples include pattern recognition through artificial intelligence (AI) and data science, 3D printing technologies, augmented reality (AR) and virtual reality (VR). Students should have practical experience with these technologies.



1B Qu 4b – Technological Innovations

Know the **suggested answer**

- a huge number of samples
 - samples with variation of fire
 - samples with fire and without fire
-
- Any two

Know the marking flexibility

- **Not Accept :**

- Attributes / considerations that is not specifically related to the training of the AI model
- Clearliness, resolution, file format

1B Qu 4b – Technological Innovations

- (b) 莉莉在郊野公園內安裝一個附有攝像鏡頭的人工智能 (AI) 系統，以探測火災。她需要挑選相片樣本來訓練此 AI 系統。舉出莉莉應考慮的**兩個**因素。 (2 分)

1 她需考慮固定的相片是否會探測到火災，她亦需考慮需大量的相片訓練以每個火災的形態也不相同。

1

1B Qu 4b – Technological Innovations

園內安裝一個附有攝像鏡頭的人工智能 (AI) 系統，以收集樣本來訓練此 AI 系統。舉出莉莉應考慮的兩點。

1. 不要有別人的樣子訓練



needs to choose photo samples to train the AI system. Give two considerations that Mary should take into account for this. (2 marks)

She should prevent any copyright issue by asking authors' permission for the right of use. Also, the resolution of the photo samples should also be checked so that the AI system can see the photos clearly.



1B Qu 4b – Technological Innovations

- Poor
- Candidates were unfamiliar with key machine learning considerations (e.g. selecting photo samples for training)

Enhance teaching strategies

- Need to let students know the “Priority of answers” !!!

1B Qu 5a – Computer Systems

Complete the following table with improvements in the hardware specifications of a desktop computer

Hardware component	Improvements	
RAM	1. Larger storage capacity	2.
Display unit	1. Larger screen	2.
CPU	1. More cores	2.

1B Qu 5a – Computer Systems

Complete the following table with **improvements** in the hardware specifications of a desktop computer

Hardware component	Improvements	
RAM	1. Larger storage capacity	2.
Display unit	1. Larger screen	2.
CPU	1. More cores	2.

Know the **suggested answer**

- RAM:
 - Higher data transfer rate
- Display unit:
 - Higher resolution / colour depth / refresh rate

Know the **suggested answer**

- CPU:
 - Higher clock rate / larger cache size / more advanced bus architecture / larger word length

Know the **suggested answer**

- RAM:
 - **Higher** data transfer rate
- Display unit:
 - **Higher** resolution / colour depth / refresh rate

Know the **suggested answer**

- CPU:
 - **Higher** clock rate / larger cache size / more advanced bus architecture / larger word length

Know the marking flexibility

- Higher vs High ???

1B Qu 5a – Computer Systems

硬件部件	提升	
RAM	1. 較大的儲存容量	2.
顯示器	1. 較大的屏幕	2. 較高像素的畫質
CPU	1. 較多的核心	2. 較效率的處理效能



1B Qu 5a – Computer Systems

硬件部件	提升	
RAM	1. 較大的儲存容量	2. 更大的時鐘頻率 
顯示器	1. 較大的屏幕	2. 更高解像度 
CPU	1. 較多的核心	2. 更多字長 

1B Qu 5a – Computer Systems

Satisfactory

Most students are good in using technical terms for related components, but some missed the “Improvement” requirement

Enhance teaching strategies

- As each has only 1 mark, need to make sure students know the answer requirement
 - Simply component attribute ?
 - Comparison requirement ?

1B Qu 5b(i) – Computer Systems

A driver program is needed to use a printer

(i) What is the major function of the driver program?

Know the **suggested answer**

- It facilitates communication between the printer and the operating system. /
- It interprets print jobs for the printer to execute. /
- It handles error messages from the printer.

Know the marking flexibility

- With similar wording, show having the idea

1B Qu 5b(i) – Computer Systems

使用打印機時需要驅動程式。

(i) 此驅動程式的主要功能是什麼？

令器材可正常使用。 

(i) What is the major function of the driver program?

(1 mark)

To allow the operating system to communicate with the peripheral device, in this case, the printer. 

1B Qu 5b(i) – Computer Systems

- Fair
- Only a small number of candidates identified the core function of the driver program

1B Qu 5b(i) – Computer Systems

- Concept and knowledge of “Driver” is somehow mentioned in the curriculum but not much
- Also, no driver concept on their daily life
- Quiz, assignment, assessment

1B Qu 5b(ii) – Computer Systems

What is the benefit of using the latest version of the driver program?

Know the **suggested answer**

- It ensures compatibility with the operating system. /
- It provides up-to-date functions. /
- It fixes bugs in the previous versions.

Know the marking flexibility

- With similar wording, show having the idea

1B Qu 5b(ii) – Computer Systems

(ii) What is the benefit of using the latest version of

reduce program bugs.

1

(ii) 使用最新版本的驅動程式有什麼好處？

可以使用到最新的功能。



1B Qu 5b(ii) – Computer Systems

- Fair
- Only a small number of candidates identified the need for update

1B Qu 5b(ii) – Computer Systems

- Teach about update of
 - OS
 - CyberSecurity device
- Also need to mention the update of driver

1B Qu 7 – Web Authoring, Computer Systems, Databases

Mr Li creates the following online form for students to enter the relevant data on the services they complete.

Service record

Class:	2A	Text box
Class number:	22	
Service:	Flag selling	
Number of service hours:	15	

1B Qu 7a(i) – Web Authoring, Computer Systems, Databases

Service record

Class:	2A	Text box
Class number:	22	
Service:	Flag selling	
Number of service hours:	15	

Suggest a better form element than "text box" for entering data in "Class". Explain briefing.

1B Qu 7a(i) – Web Authoring, Computer Systems, Databases

Service record

Class:	2A	Text box
Class number:	22	
Service:	Flag selling	
Number of service hours:	15	

Suggest a better form element than "text box" for entering data in "Class". **Explain** briefing.

1B Qu 7a(i) – Web Authoring, Computer Systems, Databases

- A better form element:

- drop down menu / pull down menu / menu / drop down list / pull down list / drop down box / radio button



- Explanation:

- Valid class names are provided to ensure that the input is reasonable or valid /
- Invalid or unreasonable classes cannot be entered.

Know the marking flexibility

- With similar wording, showing having the idea

1B Qu 7a(i) – Web Authoring, Computer Systems, Databases

-) (i) Suggest a better form element than 'text box' for entering data in 'Class'. Explain briefly. (2 marks)

It can change to click box. Since 'Class' are fixed value so it may reduce input error while using click box.

- (i) 建議一個用作輸入「班別」資料比使用文本框較佳的表格元素，並簡略說明。 (2 分)

下拉式選單，因為文本框可能會輸入不合理的數據，而使用下拉式選單就能避免這種情況發生。

1 + 1

1B Qu 7a(i) – Web Authoring, Computer Systems, Databases

- Satisfactory
- proper terms for form elements
- misunderstood the role of form elements
- Some stating that they ensure input correctness

Enhance teaching strategies

- Importance of web authoring under new (updated) curriculum

1B Qu 7a(ii) – Web Authoring, Computer Systems, Databases

The form is titled "Service record" and contains the following elements:

- Class: (A callout bubble labeled "Text box" points to this field.)
- Class number:
- Service:
- Number of service hours:
- Submit button
- Reset button

A student may enter multiple services. Mr Li finds that it is unnecessary to repeatedly enter some fields. What are their fields? Suggest a way to improve the form design.

1B Qu 7a(ii) – Web Authoring, Computer Systems, Databases

The form is titled "Service record" and contains the following elements:

- Class: (A callout bubble labeled "Text box" points to this field.)
- Class number:
- Service:
- Number of service hours:
- Submit button
- Reset button

A student may enter multiple services. Mr Li finds that it is unnecessary to repeatedly enter some fields. **What are their fields? Suggest a way to improve the form design.**

Know the **suggested answer**

- Class and class number are unnecessary.
- Use dynamic input fields / multiple textboxes for the service and number of service hours, allowing users to input them all at once without having to fill out multiple forms.

Know the marking flexibility

- With similar wording, showing having the idea

1B Qu 7a(ii) – Web Authoring, Computer Systems, Databases

- (ii) 一名學生可能會輸入多項服務。李老師發現某些欄位是什麼？建議一個改良此表格設計的方法。 重複輸入。這些欄 (2分)

1 班別, 班號。可以使用 cookies 來儲存用戶的班別, 班號, 使他不用每次都要填寫。

1B Qu 7a(ii) – Web Authoring, Computer Systems, Databases

- (ii) A student may enter multiple services. Mr Li finds that it is un¹ to repeatedly enter some fields. What are these fields? Suggest a way to improve the form (2 marks)

Those fields are "Class" and "Class number".
Mr Li can add more fields to let students
enter more than one services in one form,
like adding "Service 2" and "Number of service hour
(service 2)".

1

1B Qu 7a(ii) – Web Authoring, Computer Systems, Databases

- Satisfactory
- Students may not be able to state the term “dynamic input fields / multiple textboxes”

1B Qu 7a(ii) – Web Authoring, Computer Systems, Databases

- Student should have experience but cannot related that to ICT subject
- More practice on web / interface design

1B Qu 7b(i) – Web Authoring, Computer Systems, Databases

Mr Li decides to provide tablet computers instead of notebook computers for students to enter data

(i) Give two reasons to support his decision

Know the **suggested answer**

- It is lighter in weight / smaller in size for easy carrying.
- It features a user-friendly touch screen for easy input.
- It has a longer battery life.

Know the marking flexibility

- Answer in same category → 1 mark

1B Qu 7b(i) – Web Authoring, Computer Systems, Databases

- Satisfactory
- Some students giving answers in same category
- Some weak in explanation part
- Wrong use of Terms

Enhance teaching strategies

- More training on “Answers by category”

1B Qu 7b(ii) – Web Authoring, Computer Systems, Databases

(ii) Mr Li develops a program to run on a tablet computer, but the program cannot be installed on a notebook computer. Why?

Know the **suggested answer**

- The two computers have different operating systems. /
- The program is not cross-platform. / The program does not work on notebook operating systems.

Know the marking flexibility

- With similar wording, show having the idea

1B Qu 7b(ii) – Web Authoring, Computer Systems, Databases

- Satisfactory
- Wrong use of Terms

Enhance teaching strategies

- Terms issues :
 - Systems vs Operating Systems

1B Qu 7c – Web Authoring, Computer Systems, Databases

Suggest a validation check for CL that is more effective than a format check

Know the **suggested answer**

- Fixed Value check

Know the marking flexibility

- If cannot used the term “Fixed Value check”, but can provide suitable description, also acceptable.

1B Qu 7c – Web Authoring, Computer Systems, Databases

- Poor
- Not much know “Fixed-Value check”
- Some has misconception that “multiple validation checks could apply to a single data value”

Enhance teaching strategies

- Student should have experience (common sense) but lack the bridging to ICT knowledge

1B Qu 7d – Web Authoring, Computer Systems, Databases

(d) Suppose that there are five records in SS, as follows:

CL	CNO	SER	HR
2A	22	Flag selling	15
3D	3	Flag selling	15
2C	2	Library assistant	40
2C	5	IT prefect	35
3D	10	Flag selling	15

What are the outputs after executing the following SQL statements?

- (i) `SELECT CL, CNO FROM SS
WHERE SER='Flag selling' AND CL LIKE '2_'` (1 mark)

--

- (ii) `SELECT CL, SUM(HR) FROM SS GROUP BY CL` (2 marks)

--

Know the **suggested answer**

(i) 2A 22

(ii)

2A
3D
2C

 15
30
75
①

Know the marking flexibility

- Partial mark for (d) (ii)

(ii)	2A	15
	3D	30
	2C	75
	①	

1B Qu 7d – Web Authoring, Computer Systems, Databases

- Very good

Enhance teaching strategies

- Keep on this in teaching and assessment

Summary of teaching strategies

- Answer
 - show to fit knowledge to question scenario
 - should echoing the scenario of the qu
- Need to get more experience in everyday practice
- Know answer priorities
- Grouping answers in categories and @
Cat. give 1 answer (for qu need >1 ans)

2025 HKDSE ICT
PAPER 1B
Q6

6. s1 and s2 are two arrays. The content of s1 is

i	0	1	2	3	4
s1[i]	S	T	E	A	M

(a) What is the content of s2 after executing the following program segment?

(2 marks)

[Python version]

```
for i in range(0, 5):  
    s2[4-i] = s1[i]
```

[C++ version]

```
for (i = 0; i <= 4; i++)  
    s2[4-i] = s1[i];
```

[Pascal version]

```
for i := 0 to 4 do  
    s2[4-i] := s1[i];
```

i	0	1	2	3	4
s2[i]					

Answer:
MAETS (2)

(b) What is the content of `s2` after executing the following program segment?

(2 marks)

[Python version]

```
ch = s1[0]
for i in range(0, 4):
    s2[i] = s1[i+1]
s2[4] = ch
```

[C++ version]

```
ch = s1[0]
for (i = 0; i <= 3; i++)
    s2[i] = s1[i+1];
s2[4] = ch;
```

[Pascal version]

```
ch := s1[0];
for i := 0 to 3 do
    s2[i] := s1[i+1];
s2[4] := ch;
```

i	0	1	2	3	4
s2[i]					

Answer:
TEAMS (2)

2025 HKDSE ICT
PAPER 1B
Q8

8. In a skateboarding competition, each of five judges will give a score from 0 to 100 to each skateboarder after a run. The highest and lowest scores are dropped, and the average of the remaining three scores becomes the final score for a run, as shown in the following example:

Judge	1	2	3	4	5	Final score
Skateboarder A	98	94	95	96	90	95.00
Skateboarder B	95	88	90	90	91	90.33



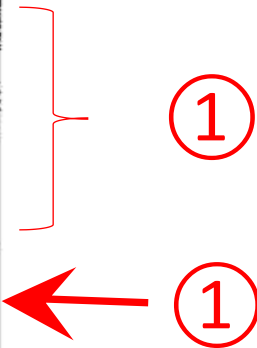
The competition uses a program with the following variables to calculate the final scores.

Variable	Description
JS	An array for storing scores given by the five judges, with indexes from 1 to 5
Smax	An integer variable, where JS[Smax] stores the highest score
Smin	An integer variable, where JS[Smin] stores the lowest score
FS	A variable for storing the final score for a run

- 8(a) (i) According to the scores of skateboarder C below, write down the values of the variables after executing the program. (2 marks)

Judge	1	2	3	4	5
Skateboarder C	68	84	82	80	92

Variable	Value
Smax	5
Smin	1
FS	82



Accept: 82.0, 82.00 and 82.

變量	數值
Smax	92
Smin	68
FS	82

0,1

Variable	Value
Smax	5
Smin	1
FS	3

1,0

Variable	Value
Smax	92
Smin	68
FS	82.00

0,1

Variable	Value
Smax	5
Smin	1
FS	82

1,1

8(a)(ii) What data type should FS be? Why?

(1 mark)

The data type should be real / float / double
as it stores the final score which is a decimal number.

*No mark for no reason

實數 / 浮點數 / 雙精度

(ii) FS 應是什麼數據類型？為什麼？

(1 分)



int, 因為數值中出現小數

(ii) FS 應是什麼數據類型？為什麼？

(1 分)



數字, 它可以是浮點數或整數

(ii) FS 應是什麼數據類型？為什麼？

(1 分)



浮點數, 因為有可能不是整數

(ii) FS 應是什麼數據類型？為什麼？

(1 分)



實數, 因為要用來計算, 如果是字符就不可以計算了。

(ii) What data type should FS be? Why?

(1 mark)



decimal, because it's more accurate

(ii) What data type should FS be? Why?

(1 mark)



String, it stores the average of remaining 3 scores which is possible to not be a whole number.

8(b) The pseudocode for computing the highest score is

```
N ← 5
Smax ← 1
for i from 2 to N
    if JS[i] > JS[Smax]
        Smax ← i
```

(i) How many times will 'if JS[i] > JS[Smax]' be executed? (1 mark)

4

(i) How many times will 'if JS[i] > JS[Smax]' be executed? (1 mark)

(N-1) times



✱✱

8(b)(ii) What is the benefit of using 'N' instead of '5' in the loop?

(1 mark)

It provides programmers with the flexibility to change the value of N in a single step across program statements involving N.

Accept: Flexible to change (彈性修改) /
Adapt to changes (適應不同情況) /
Once for all (只需改變一次)

*No mark for "easy to change (容易改動)"
without further elaborations.

(ii) 在循環中使用「N」而不使用「5」的好處是什麼？

(1 分)

可隨時更改N的值。



(ii) 在循環中使用「N」而不使用「5」的好處是什麼？

(1 分)

可以更改
值



(ii) 在循環中使用「N」而不使用「5」的好處是什麼？

(1 分)

當N出現變化時，只需更改「N<5」這一行，而不需更改「設油2至N」這一行，讓更改數值更為方便。



(ii) What is the benefit of using 'N' instead of '5' in the loop?

(1 mark)

It provides better flexibility when the array is expanded.



(ii) What is the benefit of using 'N' instead of '5' in the loop?

(1 mark)

The change will be applied to whole program if N is used.
If '5' is used, multiple changes need to be made



(ii) What is the benefit of using 'N' instead of '5' in the loop?

(1 mark)

Able to change the variable, number of judges, by one time, which save time in program designing and debugging



8(c) Please tick the appropriate box to indicate the programming language used.

Python ☐

C++ ☐

Pascal ☐

- (i) Assume that all five scores for a run given by the judges are stored in JS[1], JS[2], JS[3], JS[4] and JS[5]. By making use of the given variables, write a program segment in Python, C++ or Pascal to compute Smax, Smin and FS. (5 marks)

**

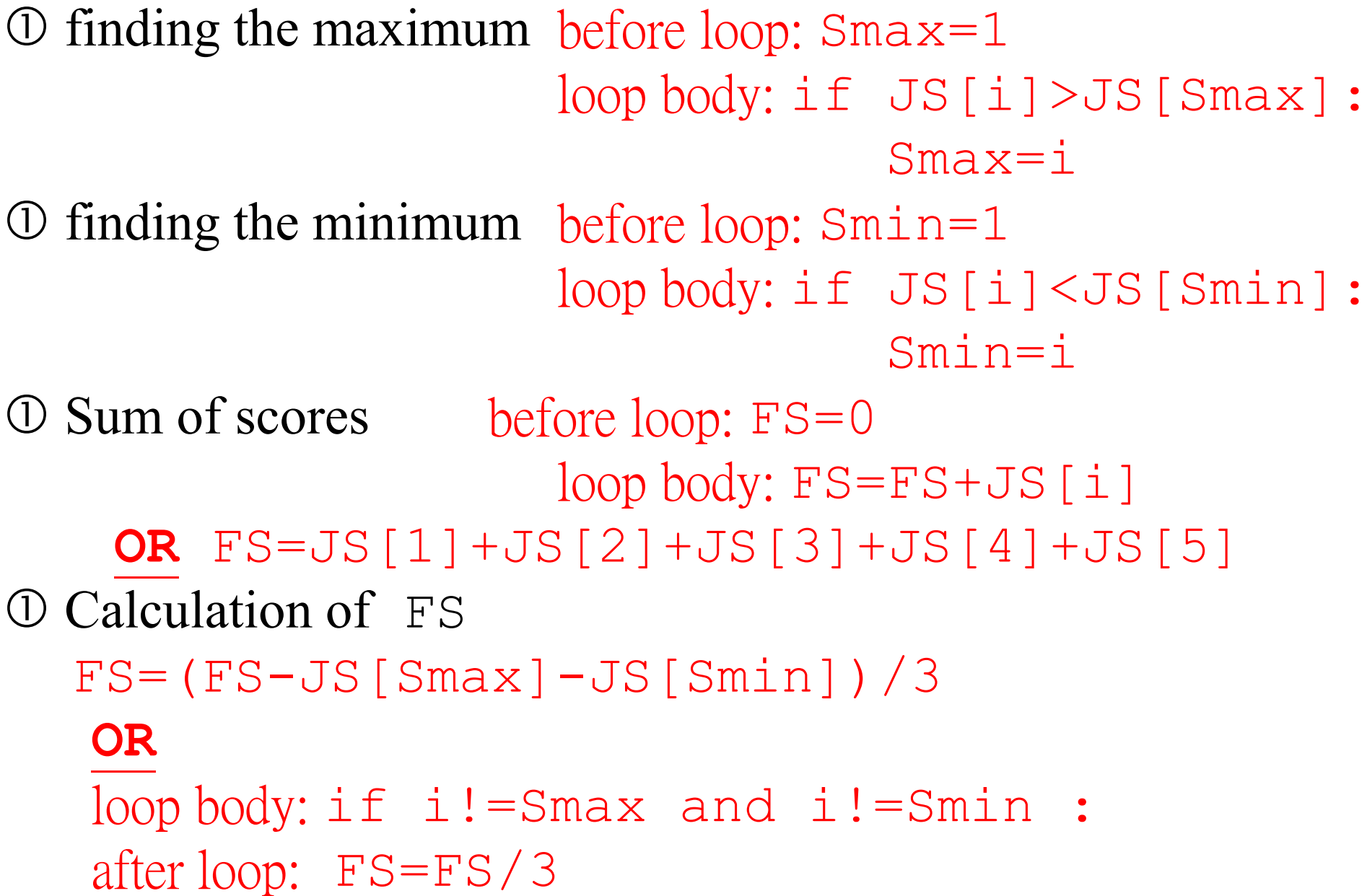
① finding the maximum

① finding the minimum

① Sum of scores

① Calculation of FS

① All correct





- ① All correct (includes
1. all loop controls correct
 2. syntax correct except "minor" mistakes
 3. all JS[] values retained
 4. no extra statements that generate mistakes
 5. Can handle 5 same scores)

*Minor mistakes:

1. For Python, colon(:) after "for" and "if"
2. For C++/Pascal, semi-colon(;) after a statement
3. Case-sensitivity is not considered. (Background: reserved words and variable names are case-insensitive in Pascal while they are case-sensitive in C++ and Python)

Python

```
N = 5
Smin = 1
Smax = 1
for i in range(2, N+1):
    if JS[i] > JS[Smax]:
        Smax = i
    elif JS[i] < JS[Smin]:
        Smin = i
FS = JS[1]
for i in range(2, N+1):
    FS = FS + JS[i]
FS = (FS - JS[Smax] - JS[Smin]) / 3
```

```
N = 5
Smin = 1
Smax = 1
FS = JS[1]
for i in range(2, N+1):
    FS = FS + JS[i]
    if JS[i] > JS[Smax]:
        Smax = i
    elif JS[i] < JS[Smin]:
        Smin = i
FS = (FS - JS[Smax] - JS[Smin]) / 3
```

```
N = 5;
Smin = 1;
Smax = 1;

for (i=2; i<=N; i++)
    if (JS[i] > JS[Smax])
        Smax = i;
    else if (JS[i] < JS[Smin])
        Smin = i;

FS = JS[1];
for (i=2; i<=N; i++)
    FS = FS + JS[i];
FS = (FS - JS[Smax] - JS[Smin]) / 3;
```

Pascal

```
N := 5;  
Smin := 1;  
Smax := 1;  
  
for i := 2 to N do  
    if JS[i] > JS[Smax] then  
        Smax := i  
    else if JS[i] < JS[Smin] then  
        Smin := i;  
  
FS := JS[1];  
for i := 2 to N do  
    FS := FS + JS[i];  
FS := (FS - JS[Smax] - JS[Smin]) / 3;
```

$N = 5$

$s_{max} = 1$

$s_{min} = 1$

$FS = JS[1]$

for i in range(2, $N+1$):

if $JS[i] > JS[s_{max}]$:

$s_{max} = i$

if $JS[i] < JS[s_{min}]$:

$s_{min} = i$

$FS += JS[i]$

$FS -= JS[s_{max}]$

$FS -= JS[s_{min}]$

$FS /= 3$

1. max : ✓

2. min : ✓

3. sum : ✓

4. FS : ✓

5. a/c : ✓

```
N = 5
FS = 0
Smax = 1
Smin = 1
for i in range(1, N-1):
    if JS[i] > JS[Smax]:
        Smax = i
```

```
for i in range(1, N-1):
    if JS[i] < JS[Smin]:
        Smin = i
```

```
for i in range(1, N-1):
    FS = FS + JS[i]
```

```
FS = (FS - JS[Smax] - JS[Smin]) / 3
```

```
print("Smax =", Smax)
print("Smin =", Smin)
print("FS =", FS)
```

1. max : ✓

2. min : ✓

3. sum : ✓

4. FS : ✓

5. a/c :

Wrong:

Loop control

$S_{max} = 1$

$S_{min} = 1$

$FS = 0$

for i in range(2, 5):

if $JS[i] > JS[S_{max}]$:

$S_{max} = i$

if $JS[i] < JS[S_{min}]$:

$S_{min} = i$

$$FS = (JS[1] + JS[2] + JS[3] + JS[4] + JS[5] - JS[S_{max}] - JS[S_{min}]) / 3$$

1. max : ✓

2. min : ✓

3. sum : ✓

4. FS : ✓

5. a/c :

Wrong:

Loop control

```

begin
  N := 5;
  Smax := 1;
  Smin := 1;
  FS := 0;
  for i := 2 to N do begin
    if JS[i] > JS[Smax] then Smax := i;
    if JS[i] < JS[Smin] then Smin := i;
    FS := FS + JS[i];
  end;
  FS := (FS - JS[Smax] - JS[Smin]) / (N - 2);
end;

```

1. max : ✓
2. min : ✓
3. sum : ✓
4. FS : ✓
5. a/c :

Wrong:
 In calculating FS,
 Only
 JS[2] + JS[3] +
 JS[4] + JS[5] is
 calculated.

```
N = 5
Smin = 1
Smax = 1
for i in range(2, N+1):
    if JS[i] > JS[Smax]:
        Smax = i
for i in range(2, N+1):
    if JS[i] < JS[Smin]:
        Smin = i
```

```
JS[Smax] = 0
```

```
JS[Smin] = 0
```

```
FS = (JS[1] + JS[2] + JS[3] + JS[4] + JS[5]) / 3
```

```
print('The final score is', FS)
```

1. max : ✓

2. min : ✓

3. sum : ✓

4. FS : ✓

5. a/c :

Wrong:

The original values of JS[] cannot be retained.

$N = 5$

$s_{max} \leftarrow 1$

$s_{min} \leftarrow 1$

for i in range $2, N$;

If $JS[i] > JS[s_{max}]$
 $s_{max} \leftarrow i$

for i in range $2, N$;

If $JS[i] < JS[s_{min}]$
 $s_{min} \leftarrow i$

$m=0$ > for i in range $1, N$;

If $JS[i] \neq s_{max}$ or $JS[i] \neq s_{min}$;

$m = m + JS[i]$

$FS = m/3$

1. max : ✓

2. min : ✓

3. sum : ✓

4. FS :

5. a/c :

Wrong:

**Wrong indentation for
 $FS = m / 3$**

Wrong loop control

$N = 5$

$s_{max} = 1$

$s_{min} = 1$

for i in range(2, $N+1$):
if $JS[i] > JS[s_{max}]$:

$s_{max} = i$

if $JS[i] < JS[s_{min}]$

$s_{min} = i$

for i in range(1, $N+1$):

$FS = FS + JS[i]$

$FS = (FS - JS[s_{max}] - JS[s_{min}]) / (N - 2)$

1. max : ✓

2. min : ✓

3. sum :

4. FS : ✓

5. a/c :

Wrong:

FS = 0

is missing

FS = 0

N = 5

Smax = 1

Smin = 1

for i in range(1, N):

if JS[i] > JS[Smax]:

Smax = i

if JS[i] < JS[Smin]:

Smin = i

for j in range(0, N):

if (j != Smax) or (j != Smin):

FS = FS + JS[j]

FS = FS/3

1. max : ✓

2. min : ✓

3. sum : ✓

4. FS :

5. a/c :

Wrong:
Should use and
not or

Wrong loop control

$S_{max} = 1$

$S_{min} = 1$

$FS = 0$

for i in range(2, 6):

 If $JS[i] > JS[S_{max}]$:

$S_{max} = i$

 If $JS[i] < JS[S_{min}]$:

$S_{min} = i$

for i in range(1, 6)

 If $JS[i] \neq JS[S_{max}]$ AND $JS[i] \neq JS[S_{min}]$:

$FS = FS + JS[i]$

$FS = FS / 3$

1. max : ✓

2. min : ✓

3. sum : ✓

4. FS :

5. a/c :

Wrong:

Should not compare value

**if $JS[i] \neq JS[S_{max}]$ and
 $JS[i] \neq JS[S_{min}]$**

Should compare index

if $i \neq S_{max}$ and $i \neq S_{min}$

**Else, if there are same values in $JS[]$,
FS cannot be calculated correctly.**

$N = 5$

$S_{max} = 1$

$S_{min} = 1$

for i 2 to N :

if $JS[i] > JS[S_{max}]$

$S_{max} = i$

if $JS[i] < JS[S_{min}]$

$S_{min} = i$

$$FS ((JS[1] + JS[2] + JS[3]) + JS[4] + JS[5]) - (JS[S_{max}] + JS[S_{min}]) / (N - 2)$$

1. max : ✓

2. min : ✓

3. sum :

4. FS :

5. a/c :

Wrong:

Missing = (assignment operator)

```

N = 5
Smax = 1
Smin = 1
for i in range(2, N+1)
    if JS[i] > JS[Smax]
        Smax = i
        輸出 JS[i]
for i in range(2, N+1)
    if JS[i] < JS[Smin]
        Smin = i
        輸出 JS[i]

```

1. max : ✓
2. min : ✓
3. sum :
4. FS :
5. a/c :

Wrong:
Missing handling of sum and FS

$N = 5$

$S_{\max} = 0$ **Wrong:**

$S_{\min} = 0$ **Wrong initialization of $S_{\max}$ and $S_{\min}$**

```
for i in range(1, N):
    if JS[i] > JS[Smax]:
        Smax = i
    if JS[i] < JS[Smin]:
        Smin = i
```

$FS = 0$

```
for i in range(0, N):
    if (i != Smax) and (i != Smin):
        FS = FS + JS[i]
```

$FS = FS / (N - 2)$

1. max :

2. min :

3. sum :



4. FS :



5. a/c :

max = JS[1]

min = JS[1]

for i in range(2, 6):

if JS[i] > max:

max = JS[i]

if JS[i] < min:

min = JS[i]

Wrong:

**Wrong manipulation of
Smax and Smin**

**(store the index number,
not the value of max, min)**

1. max :

2. min :

3. sum :



4. FS :



5. a/c :

$FS = JS[1] + JS[2] + JS[3] + JS[4] + JS[5] - \text{max} - \text{min}$

$FS = FS / 3$

$\text{roundoff}(FS, 2)$

$S_{max} = JS[1]$

$S_{min} = JS[1]$

$FS = JS[1]$

for i in range (2, 6):

$FS += JS[i]$

if $S_{max} < JS[i]$:

$S_{max} = JS[i]$

if $S_{min} > JS[i]$:

$S_{min} = JS[i]$

$FS = (FS - S_{max} - S_{min}) / 3$

Print (S_{max})

Print (S_{min})

Print (FS)

1. max :

2. min :

3. sum :

4. FS :

5. a/c :



Wrong:

Wrong manipulation of

S_{max} and S_{min}

**(store the index number,
not the value of max, min)**

$S_{max} = JS[1]$

$S_{min} = JS[1]$

$FS = JS[1] + JS[2] + JS[3] + JS[4] + JS[5]$

for i in range(2,6)

$JS[i] > S_{max}$

$S_{max} = JS[i]$

for i in range(2,6)

$JS[i] < S_{min}$

$S_{min} = JS[i]$

$FS = (FS - S_{min} - S_{max}) \div 3$

Wrong:

-Missing if

**-Wrong manipulation of
Smax and Smin**

**(store the index number,
not the value of max, min)**

-wrong / operator

1. max :

2. min :

3. sum :



4. FS :

5. a/c :

```

N ← 5
smax ← 1
smin ← 1
Total ← 0
for i from 1 to N
    if JS[i] > JS[smax]
        smax ← i
    if JS[i] < JS[smin]
        smin ← i
    Total ← Total + JS[i]
Total ← Total - JS[smin] - JS[smax]
FS ← Total / 3
Output FS

```

Wrong:

Pseudo code -> Not language-specific

1. max :

2. min :

3. sum :

4. FS :

5. a/c :



8(c) (ii) Complete the following program segment to ensure that the scores (sc) entered by the judges are valid, i.e. $0 \leq sc \leq 100$. (2 marks)

[Python version]

```
sc = int(input())
while (  ):
    print('Invalid input. Please input again.')
    sc = int(input())
```

[C++ version]

```
cin >> sc;

while (  ) {
    cout << "Invalid input. Please input again.";
    cin >> sc;    }
```

[Pascal version]

```
readln(sc);

while (  ) do begin
    writeln('Invalid input. Please input again.');
```

readln(sc);

end;

[Python 版本]

```
sc = int(input())
```

```
while (  $sc > 100$  or  $sc < 0$  ):
```



[Pascal version]

```
readln(sc);
```

```
while (  $(sc < 0)$  or  $(sc > 100)$  ) do begin
```



[Python 版本]

```
sc = int(input())
```

```
while (  $sc \leq 0$  or  $sc \geq 100$  ):
```



[Python version]

```
sc = int(input())
```

```
while (  $(sc < 0)$  AND  $(sc > 100)$  ):
```



[C++ version]

```
cin >> sc;
```

```
while (  $sc < 0$  ||  $sc > 100$  ) {
```



2025 HKDSE ICT
PAPER 1B
Q9

9(a)

Mr Cheung designs an information system for students in a school. The usernames of students consist of four parts: form, class, class number and check digit, represented by F, C, N, and D respectively, as shown below.

Example:

1	A	24	5
Form	Class	Class number	Check digit
F	C	N	D

(a) What is the maximum number of students that can be supported by the system? (2 marks)

Answer:

$6 \times 40 \times 2 = 480$ (2)
(No other answer accepted)

Remarks:

Ignore formula

9(b)(i) Are '4B115' and '2C180' valid usernames? Explain briefly. For the valid username(s), show the calculation of the check digit. (3 marks)

(1 mark for 2C180)

(2* mark for 4B115)

* Marking criteria

2M: Illustrate a comprehensive and logical answer

1M: Illustrate a relevant answer

9(b)(i) ***

Answer:

2C180 is invalid because

the class group is 'C' is not valid / does not exist.

(1 mark for 2C180, 0M for no explanation)

4B115 is valid because

the remainder of the check digit is 5.

$$(11 + 4) \times 3 \bmod 10 = 5$$

Or

$$(11 + 4) \times 3 / 10 = 4 \dots 5$$

2 mark for 4B115

**- Complete
expression with
calculation (2M)**

**- Incomplete
expression (1M)**

**- No explanation
(0M)**

9(b)(ii)

*

(ii) What is the limitation of using this check digit? Explain your answer with an example. (2 marks)

(2* mark for the answer)

- Complete expression with example (2M)

- Incomplete expression (1M)

Answer:

It cannot spot out an error when two digits are entered wrongly but resulting in the same check digit. (explain with example).

e.g. consider the example 1A245 and 1A145.

Check digits of 1A24: $(1 + 24) \bmod 10 = 5$

Check digits of 1A14: $(1 + 14) \bmod 10 = 5$

Check digit of both case is 5, yet the error of wrong class number cannot be detected.

9(b)(ii)

*

(ii) What is the limitation of using this check digit? Explain your answer with an example. (2 marks)

(2* mark for the answer)

- Complete expression with example (2M)**
- Incomplete expression (1M)**

Answer:

It cannot detect any incorrect data of class which results in same check digit (explain with example)

e.g. consider the example 2A80 and 2B80.

Check digits of 2A80: $(2 + 8) \bmod 10 = 0$

Check digits of 2B80: $((2 + 8) * 3) \bmod 10 = 0$

Check digits of both case is 0, yet the error of wrong class cannot be detected.

9(b)(ii)

*

(ii) What is the limitation of using this check digit? Explain your answer with an example. (2 marks)

(2* mark for the answer)

- Complete expression with example (2M)**
- Incomplete expression (1M)**

Answer:

It cannot detect more than 1 error in data entry which result in same check digit (explain with example)

e.g. consider the example 1A11 and 2A10.

Check digit of 1A11: $(1 + 11) \bmod 10 = 2$

Check digit of 2A10: $(2 + 10) \bmod 10 = 2$

Check digit of both case is 2. The error cannot be detected.

9(b)(ii)

*

(ii) What is the limitation of using this check digit? Explain your answer with an example. (2 marks)

(2* mark for the answer)

- Complete expression with example (2M)
- Incomplete expression (1M)

(accept any other correct explanation of not able to spot error in data entry with valid examples)

Not accept:

- time consuming to do calculation
- can only check number but not letter
- the check digit can only be 0 to 9
- can only handle 480 students

9(c)

**

(c) Mr Cheung converts the algorithm in the flowchart to the pseudocode below.

```

Line   Content
100    FLAG ← true
110    while FLAG
120        input a username
130        compute F, C, N, D
140        if 1<=F<=6 or 1<=N<=40
150            S ← F
160            if C = "A"
170                if C = "B"
180                    S ← S * 3
190                S ← remainder of (S / 10)
200            if D = S
210                FLAG ← false
220        if not FLAG
230        Output "Invalid username"

```

However, there are four mistakes after line 130 in the pseudocode. Fill in the following table to show the location of each mistake and its correction. One of the corrections is given. (3 marks)

Line	Corrected statement
140	<u>if 1<=F<=6 and 1<=N<=40</u>
160	<u>if C = "A" or C = "B"</u>
220	<u>if FLAG</u>

1 mark for
one
answer

9(c) 140 if $1 \leq F \leq 6$ and $1 \leq N \leq 40$
160 if $C = \text{"A"}$ or $C = \text{"B"}$
** 220 if FLAG

Accept:

140 if $1 \leq F$ and $F \leq 6$ and $1 \leq N$ and $N \leq 40$
160 if $C = \text{"a"}$ or $C = \text{"b"}$
220 if $\text{FLAG} = \text{TRUE}$
220 if $\text{FLAG} \neq \text{FALSE}$
220 if $\text{FLAG} \neq \text{FALSE}$
220 if not ($\text{FLAG} = \text{FALSE}$)
220 if $\text{FLAG} = \text{true}$
220 if $\text{FLAG} = \text{True}$
220 if $\text{FLAG} = \text{'TRUE'}$
220 if $\text{FLAG} = \text{"TRUE"}$
220 if $\text{FLAG} = \text{'True'}$
220 if $\text{FLAG} = \text{"true"}$

Remarks for pseudo code:
Focus on logical reasoning
No standard syntax

- accept small letter including "a" and "b"
- accept ' or "
- accept $\geq$ and $\leq$
- accept $=$
- accept $\neq$ or $\neq$

9(d)

**

(d) Mr Cheung plans to download and install free word processing software in the school. After reading the terms of use, he decides to give up on the installation. Give two reasons to support his decision.

(2 marks)

1 mark for one answer

Be aware that similar answer should be grouped in same category

(any two)

- There are privacy issues such as the collection of user data (e.g. the content of documents)
- It offers fewer functions compared to the paid version / some functions can only be used after payment
- It may contain advertisement
- The terms of use may be violated
e.g. cannot be used in education / for personal use only / not for organizational use
e.g. can only be installed in one device / number of devices for software installation cannot be fulfilled

9(d)

**

(d) Mr Cheung plans to download and install free word processing software in the school. After reading the terms of use, he decides to give up on the installation. Give two reasons to support his decision.

(2 marks)

1 mark for one answer

Be aware that similar answer should be grouped in same category

Do not accept:

- system requirement not met (not compatible with operating system, insufficient RAM)
- less technical support
- open-source software
- needs to download and install
- the freeware may contain virus

Briefing Session on DSE ICT Paper 2A 2025

Key Principles	Example
Correct SQL syntax expected	• Reject improper structure (e.g., <code>LIKE 'B88%' AND ORDER BY SD DESC</code>) • Reject invalid operators (e.g., <code>≤</code> instead of <code><=</code>) • Accept very minor mistakes
Permit variations in SQL syntax	• Accept equivalent operators (e.g. <code>LIKE 'B88%'</code> vs <code>LIKE 'B88*'</code>) (e.g., <code>SD <= '26-3-2025'</code> vs <code>SD <= #26/3/2025#</code>) • Accept redundant joining
Deduct for conceptual errors	• Reject invalid claims (e.g., "less storage" in benefits of denormalisation) • Reject quoted numerical values (e.g., 2012 vs '2012') • Reject missing ERD relationships
Award full marks for functionally equivalent methods	• Accept functional alternatives (e.g., inner joins VS subqueries) • Reject non-subquery aggregates (e.g., <code>WHERE PRICE = MAX(PRICE)</code>)

General Marking Rules

Performance Indicator

<u>Star</u>	<u>Performance</u>
*****	Excellent
****	Good
***	Satisfactory
**	Fair
*	Poor

The percentage of students who answered correctly is reflected through these star ratings, with higher star counts indicating a greater proportion of correct responses.

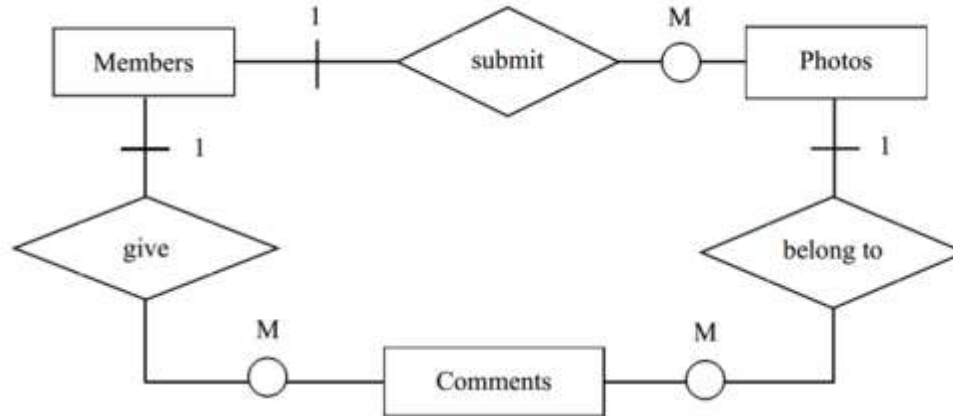
Q1a

Q.
A.

(a) The partial ER diagram for the database is given below. Draw the ER diagram for the database. It is not necessary to draw attributes. (4 marks)



Comments

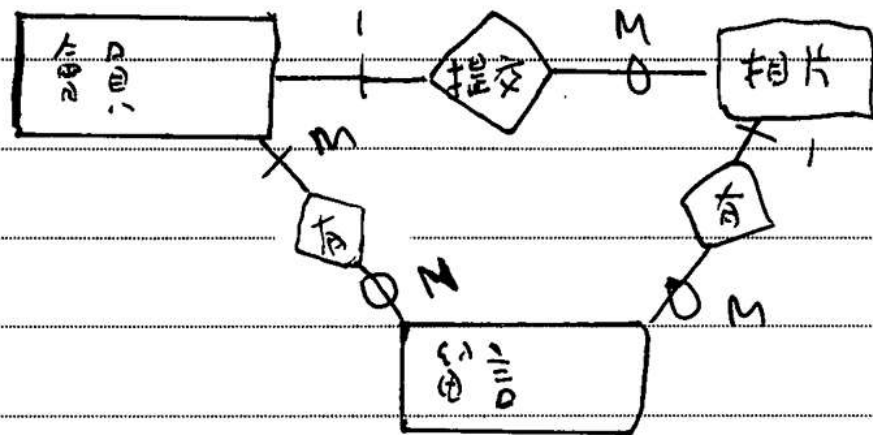


Two relationships ①

give: 1-M ① | ○ ①

belong to: 1-M ① | ○ ①

(4 out of 5)

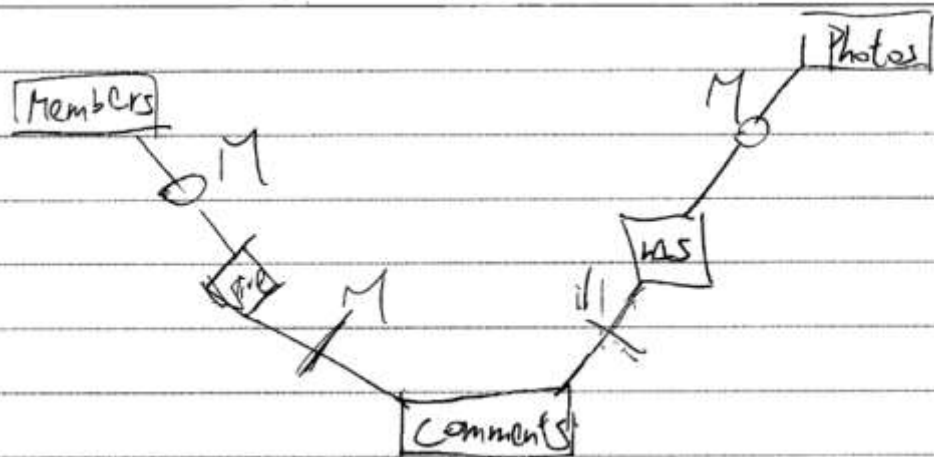


Two relationships ① ✓

give: 1-M ① ✗ | 0 ① ✓

belong to: 1-M ① ✓ | 0 ① ✓

(4 out of 5)



Two relationships ① ✓

give: 1-M ① ✗ | 0 ① ✗

belong to: 1-M ① ✗ | 0 ① ✗

(4 out of 5)

Q1b

Q.
A.

(b) Describe a benefit of enabling the rollback in the database management system.

(2 marks)

(b) Recovery / Restore / Revert to a previous state in the event of errors during transactions, especially when multiple operations are executed within a single transaction. / Assist in testing various scenarios by undoing changes made during the testing stages of database development. /

1,1

When you ~~to~~ update, insert or delete data in the database wrongly, rollback allows you to restore the database to its previous state, increasing the fault tolerance of the ~~sys~~ DBMS, as some data is hard to insert again once ~~deleted~~ deleted.

原因：回滾使数据库能回復至先前的狀態，能有效地拯救数据库错误地被更新。

可將數據庫復回至先前狀態。

b) It allows users to undo mistakes if they make one other than drop tables.

b) rollback in database management system can rollback the step of last step before you execute the newest statement. It benefit user by giving confidence for easier managing the database.

Q2a

**

Q2b

T1

CID	AID	AMT
C01	F01	1000
C02	S01	0
C02	S02	6000
C03	F01	0

T2

CID	AID	AMT
C01	F01	1000
C02	S01	500
C02	S02	0
C03	S01	0

Q.
A.

(a) How many records are listed after executing the following SQL statement?

(1 mark)

```
SELECT *
FROM T1
UNION
SELECT CID, AID, AMT
FROM T2
```

(b) List the updated record(s) in T1 after executing the following SQL statement.

(2 marks)

```
UPDATE T1
SET T1.AMT = 0
WHERE T1.AMT > 0 AND
      (EXISTS
        (SELECT * FROM T2
         WHERE T1.CID = T2.CID AND T2.AMT = 0))
```

(a) 7

(b) The value of AMT in the third record is changed to 0.

CID	AID	AMT
C02	S02	0

correct record ①

correct value of AMT ①

UNION removes duplicate rows from the result set, returning only distinct rows from the combined queries.

Q2a

**

(a). 1 

a) 8  records

a. 5 

a) 4 ^{kk}/₅ 

Q2b

CID	AID	ATT
C01	S01 	0 

C01	F01	1000
C02	S01	500
C02	S02	6000 
C03	F01	0
C03	S01	0

Q3a

**

Q.
A.

The following input form using an SQL command inserts a record into CUS.

Customer Information Input Form

Customer name:

Identity code of the customer:

Year of first use:

INSERT INTO CUS VALUES ()

Write the missing part of the SQL command.

(1 mark)

(a) "ABF218", "So Siu Ming", 2012

No quotes

"So Siu Ming", "ABF218", 2012



"So Siu Ming", "ABF218", "2012"



ABF218, 蘇小明, 2012



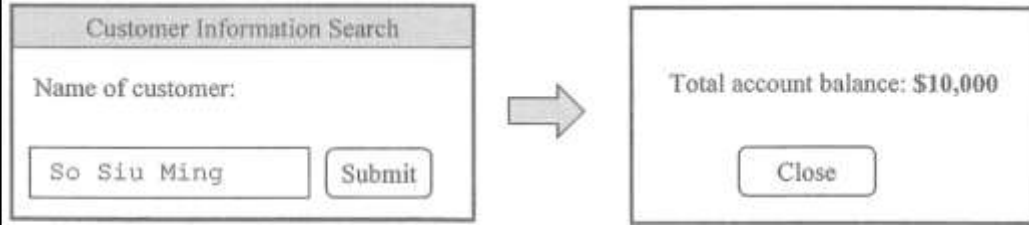
CCODE, CNAME, YEAR



Q3b

Q.
A.

A customer may have several accounts. In the following, a SQL statement is used to find the total account balance of the customer 'So Siu Ming'.



Write the SQL statement.

(3 marks)

```
SELECT SUM(BAL)
FROM CUS, ACC
WHERE CUS.CCODE = ACC.CCODE
AND CUS.CNAME = 'So Siu Ming'
GROUP BY CUS.CNAME (or CUS.CCODE)
```

①

1×3

①

①

SELECT CUS.CNAME, ACC.BAL, ~~X~~

INNER JOIN CUS, ACC, ~~X~~

Where CUS.CNAME = "蘇小明", ✓

Order by CUS, ACC

SELECT SUM(BAL) ✓

FROM ACC ✓

WHERE CCODE IN (SELECT CCODE

FROM CUS

WHERE CNAME = 'So Siu Ming'); ✓

Q4

A new database schema in Third Normal Form is drafted below. The database table HW stores information on homework, while the database table STMARK stores information on students' marks.

STUD (SN, SNAME)

COURSE (CID, CNAME)

HW ()

STMARK ()

a1: HW (HC, CID, HDES)

4

a2: STDMARK (SN, CID, HC, MK)

(correct fields ① + primary key ①) × 2

Note:

a1: HW (HC, HDES) 1

a2: STDMARK (SN, HC, MK) 1

HW (HC, HDES)

STMARK (SN, CID, HC, MK)

(correct fields ① + primary key ①)

(correct fields ① + primary key ①)

Q4

a1: HW (HC, CID, HDES)a2: STD MARK (SN, CID, HC, MK)

(correct fields ① + primary key ①) × 2

Note:

a1: HW (HC, HDES) 1a2: STD MARK (SN, HC, MK) 1HC, CID, HDESCID, HC, MK

(correct fields ① + primary key ①)



(correct fields ① + primary key ①)



(correct fields ① + primary key ①)



(correct fields ① + primary key ①)

HC HDESSN MK HC CID

Q5a

Q.

A.

BK

Field name	Data type	Description	Example
BID	Character	Identity code of booking	B88123456
RN	Character	Room number	R0023
GID	x	Identity code of guest	00018
SD	Date	Check-in date	25-3-2025
ED	Date	Check-out date	28-3-2025

(a) State the data type, x, for GID. Explain briefly.

(1 mark)

answer without explanation is not accepted

Character. The identity code of guest contains leading zeros.

1

(a) integer

(a) Character, because the example of GID have 0 as the first number which is a character as number with 0 at first can't be numeric.
 show GID's data type

a.) Character

(a) 字符，可顯示首數字0

(a) 數值，GID的數據內容是由數字組合而成的。

Q5b(i)

Q.

A.

BK

Field name	Data type	Description	Example
BID	Character	Identity code of booking	B88123456
RN	Character	Room number	R0023
GID	x	Identity code of guest	00018
SD	Date	Check-in date	25-3-2025
ED	Date	Check-out date	28-3-2025

- (i) List the booking records where the first three characters of identity code of booking are 'B88' in descending order of SD. (2 marks)

(i) `SELECT *`
`FROM BK`
`WHERE BID LIKE 'B88%'` ('B88*' or `SUBSTRING(BID,1,3)='B88'`)
`ORDER BY SD DESC`

2

`WHERE BID LIKE 'B88%'`① `ORDER BY SD DESC`①

(i) `SELECT * FROM BK WHERE BID LIKE "B88*" ORDER BY SD... DESC` ✓

i) `SELECT SD FROM BK`
`WHERE BID LIKE B8890` ✗
`ORDER BY SD DESC` ✓

(i) `SELECT BID`
`FROM BK`
`WHERE BID = "B88"` ✗
`AND SD DESC` ✗

Q5b(ii)

**

BK

Field name	Data type	Description	Example
BID	Character	Identity code of booking	B88123456
RN	Character	Room number	R0023
GID	x	Identity code of guest	00018
SD	Date	Check-in date	25-3-2025
ED	Date	Check-out date	28-3-2025

Q.
A.

List the room numbers of the hotel rooms booked for 26-3-2025.

(2 marks)

(ii) SELECT RN
FROM BK
WHERE SD <= '26-3-2025' AND '26-3-2025' <= ED (or other date formats)

2

Any one condition ①

All correct ②

(ii) SELECT RN FROM BK WHERE SD='26-3-2025' OR
ED='26-3-2025' OR NOT IN (SELECT RN FROM BK WHERE
SD<'26-3-2025' AND ED<'26-3-2025') OR NOT IN (SELECT RN
FROM BK WHERE SD>'26-3-2025')

SELECT RN FROM BK WHERE SD="26-3-2025"

SELECT r.kn FROM r.km, b.BK
WHERE r.kn = b.kn
AND b.SD DATE = "25-3-2025"

Alternative:

SELECT RN
FROM BK
WHERE '26-3-2025' BETWEEN SD AND ED

Q5b(iii)

**

Q.
A.

RM

Field name	Data type	Description	Example
RN	Character	Room number	R0023
PRICE	Numeric	Room price	1500
RTYPE	Character	Room type	Single

BK

Field name	Data type	Description	Example
BID	Character	Identity code of booking	B88123456
RN	Character	Room number	R0023
GID	x	Identity code of guest	00018
SD	Date	Check-in date	25-3-2025
ED	Date	Check-out date	28-3-2025

(iii) List the identity codes of guests who have booked the hotel room with the highest room price. (3 marks)

(iii) SELECT DISTINCT GID
FROM RM A, BK
WHERE A.RN = BK.RN AND
A.PRICE IN
(SELECT MAX(PRICE)
FROM RM)

3

Inner join ①

A.PRICE =/IN (any subquery) ①

SELECT MAX(PRICE) FROM RM ①

(iii) SELECT b.GID FROM BK b INNER JOIN RM r ON b.RN =
r.RN WHERE r.PRICE = (SELECT MAX(PRICE) FROM RM)

SELECT GID
FROM BK

WHERE IN (SELECT MAX(PRICE)
FROM RM)

SELECT BK.GID
FROM BK, RM
WHERE BK.RN = RM.RN AND
MAX(RM.PRICE)

SELECT b.BID FROM r.km, b.kn
WHERE b.kn = r.RN
AND MAX(PRICE)

Q5c

Q.
A.

Briefly describe the use of the following SQL statement.

(2 marks)

```
SELECT RN FROM RM  
MINUS  
SELECT RN FROM BK
```

Find the hotel rooms that have no booking records.

2

(c) To find the room which is not being booked. ✓

c.) To link and minus two table together ✗

(c) Find the common RN ^{exist} in both RM and BK ✗

(c) RM的RN 依賴BK的RN ✗

(c) 將數據庫表 RM 和 BK 連接 ✗

Q5d

Q.
A.

Why does the following SQL statement cause an integrity problem?

(1 mark)

```
INSERT INTO BK VALUES ("B88332211", "R0068", "12345", "15-8-2025",  
"12-8-2025")
```

The check-in date is later than the check-out date, which is invalid. This causes an integrity problem when checking the available rooms (room numbers).

1

(d) There will be referential integrity as BK reference RM by RN, but RM do not have the data of room R0068, which BK cannot find the information of R0068 from RM.

(d) It cause Domain integrity problem because the check-in date is after the check-out date which does not make any sense and ansing this integrity.

d.) Because the book hotel of the end date is earlier than the start date

(d) 因為入住日期大於退房日期

Q5ei

Q5eii

**

Q.
A.

(e) (i) Briefly describe a way of denormalising RM and BK.

(1 mark)

(ii) Give a benefit of the action in (i).

(1 mark)

(e) (i) Merge RM and BK into one database table. /

1

Add redundant fields in RM and BK. /

Create derived attributes in RM and BK. /

Create and use views with RM and BK.

(ii) Since the need for complex joins between RM and BK is reduced,
it significantly enhances the speed of query execution and so improves the query performance /
it reduces the memory consumption during query execution /
it simplifies the overall database architecture /
it simplifies the query writing and so saves development time.

1

Q5ei

Q5eii

**

- (e) (i) Merge RM and BK into one database table. /
Add redundant fields in RM and BK. /
Create derived attributes in RM and BK. /
Create and use views with RM and BK.

- (ii) Since the need for complex joins between RM and BK is reduced,
it significantly enhances the speed of query execution and so improves the query performance /
it reduces the memory consumption during query execution /
it simplifies the overall database architecture /
it simplifies the query writing and so saves development time.

(e i) 組兩個數據庫合併為一個數據庫 ✓

(ii) 運算 SDL 的指令較簡單 ✓

e(i) 將 RM 和 BK 合併成一個資料表 ✓

(ii) 提取數據速度更快 ✓

(e)(i) for BK it should be separate into BK(BID, SD, ED) BID

(ii) enhance the interference of the database X

HKEAA HKDSE

ICT Briefing 2025

Paper 2B –Web Application Development

6. John plans to develop a Hong Kong restaurant guide web site.

(a) John wants to design a web page with the search criteria shown below:

- District (e.g. ‘Yau Tsim Mong’), with sub-district (e.g. ‘Mong Kok’)
- Whether advance booking is available
- Spending per head (e.g. \$200 - \$400)

Booking

-

□

X

Search criteria:

Search

Draft a user-friendly design for the web page with **three** different types of input controls. Annotate your design, where appropriate. (3 marks)



(a)	Appropriate use of input controls	1 × 3
-----	-----------------------------------	-------

a) Search criteria:

District: — Dropdown ✓

Sub-district:

Advance booking available: ☐ Yes ☐ No

Radio button ✓

Spending per head: — — — slider ✓

a) | - | □ | x

Booking

Search criteria:

District: Yan Tsim Mong ▾ ← drop down menu

sub-district: ☐ Mong Kok

☐ place 2 ← radio button

☐ place 3

advance booking: Available / Not Available ✓

spending per head: \$ ← text box

* only input number

Search

by using a drop down menu, user can choose which district they want to go. Then use a radio button that allows user to select multiple or even more option (the place) they want.

By using a text box for 'spending per head' customer can input the price they want specifically.

a)

地區：

分區：

人均消費：

下拉式選擇，
選擇地區後再選
擇分區。

是否預訂：☒ 是 ☐ 否

(文字輸入框，可自
行決定上下限)

(點選按鈕，減少輸入錯誤)

某方邊身以夕白客第，非才可謂

(a)

搜尋條件：

地區：

下拉式選單

分店：



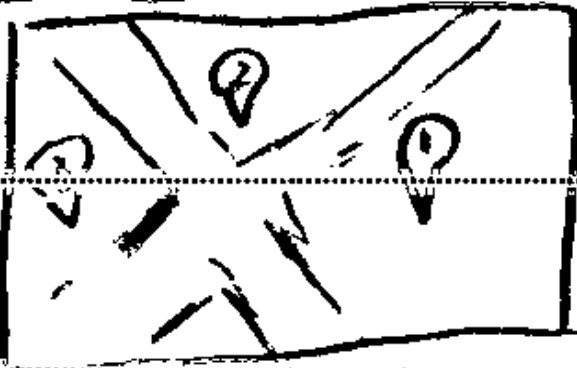
是否可以預訂：是 ☐ 否 ☐

複選框

人均消費： -

文字框



預訂		-10/x	
地區:		例:	旺角
熱門餐廳:		平均\$200-\$400	
預訂	更多餐廳		
搜尋			

在地區輸入位置后，會推比較熱門的餐廳，以及人均消費
 如果可以預訂：就顯示預訂如果不可就不顯示，有更多的餐廳可查



- (b) (i) John decides to use external CSS. Give a reason to support his decision. (1 mark) ★ ★ ★
- (ii) John decides to use inline CSS on some web pages. Give a reason to support his decision. (1 mark) ★ ★

- (b) (i) Styles in multiple HTML pages can be consistent, simplifying updates and reducing redundancy. 1
- Alternative:
Better organisation / faster load time / CSS cached and so faster page rendering / simplified HTML and more readable
- (ii) It applies to individual cases 1

bi) Allow modular, so the external CSS can be reused on other pages without duplicating coding.



ii) Easier to style the web pages, as the inline CSS is inside an HTML file, allowing easier access to change style without dig into the file hierarchy.



bi) It can speed up the searching speed for the web site

bii) Inline CSS can provide a specific design of the web page designed by the developer without linking the HTML on specific items such as font size and colour page to other external sheet which speed up the process for user to view



b)i) 節省時間。

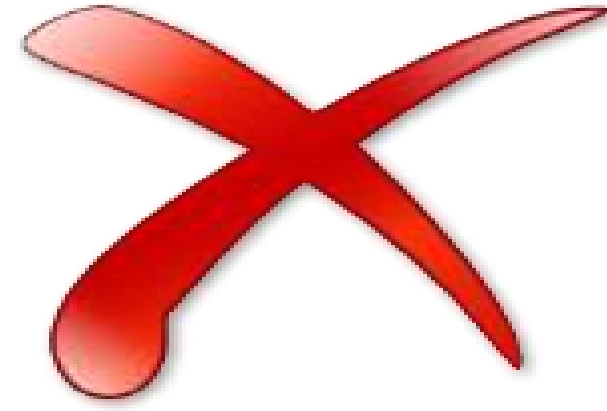
ii) 程式更簡^太約

(bi) 便於重複使用。

(bii) 便於更改

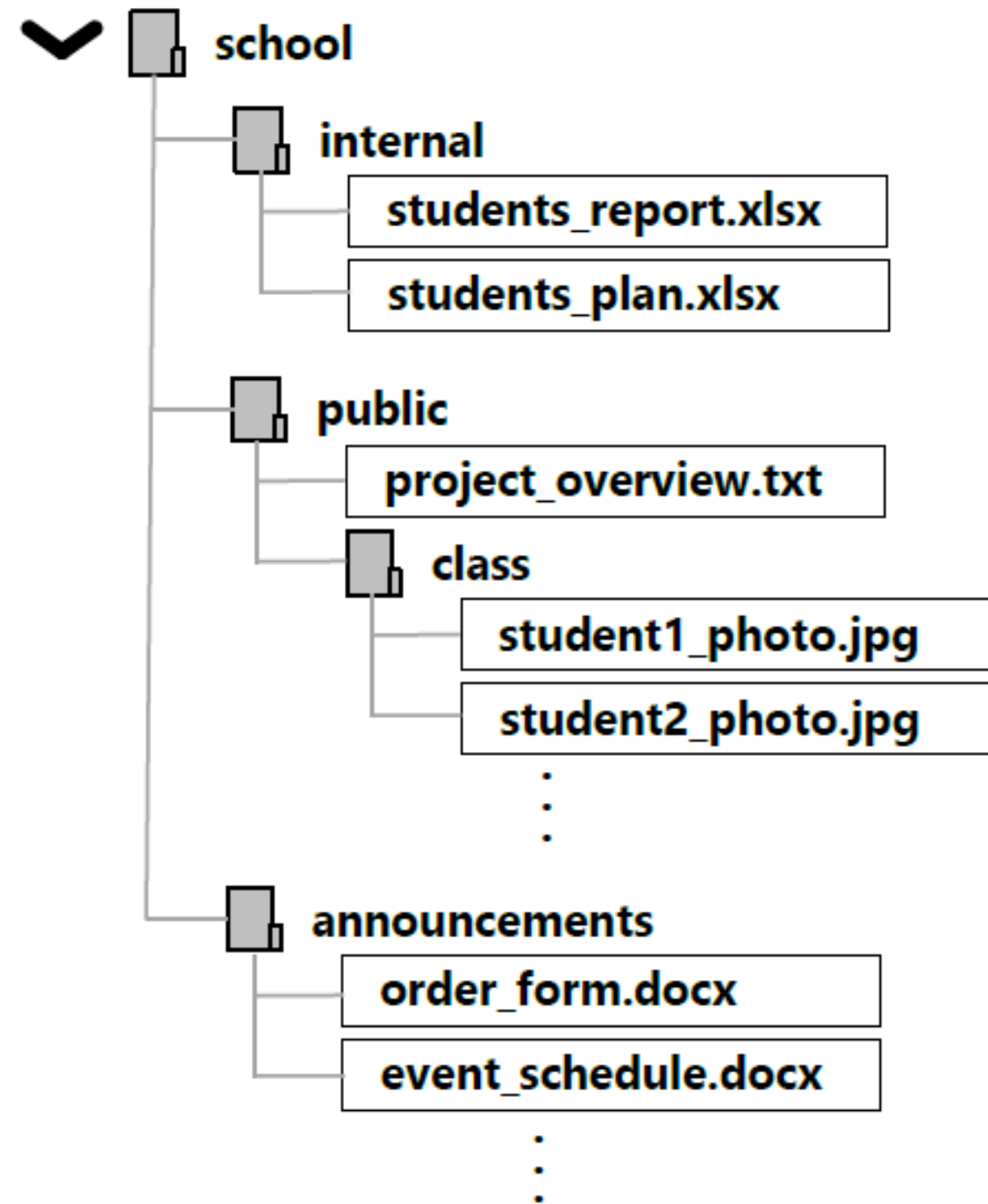
(b)(i) 用戶可自行更改樣式

(ii) 無需下載就可使用



7. Alice sets up a server in a school to support file sharing and printer sharing for teachers, parents and students.

(a) The structure of some of the folders and files in the server is shown below:



All rights granted to users for a folder will be inherited to all its subfolders and files.

- (i) Give a risk of granting the read and write rights of the folder **school** to all users. (1 mark) ★★☆☆☆
- (ii) The read and write rights for the file **order_form.docx** have been granted to all parents. What will happen if only the read right of the folder **announcements** is then granted to all parents? (1 mark) ★★☆☆☆
- (iii) What should Alice do to ensure that students are only allowed to view their own photos stored in the folder **class**? (1 mark) ★★

- | | | | |
|-----|-------|--|---|
| (a) | (i) | There will be no access controls on users.
(Consequences of misuse of read / write / delete / etc. rights on the folder school) | 1 |
| | (ii) | Parents can only read event_schedule.docx and order_form.docx . | 1 |
| | (iii) | Alice should grant the read rights of public and class to all students,
and grant the read rights of each photo file only to the corresponding student. | 1 |

(a)(i) Students can view and edit confidential files like ✓

students report, this can lead to serious consequences.

(a)(ii) Parents will lose rights to write the file ✓

order_form.docx as it is inside the announcements folder.

(a)(iii) Alice can put a passcode lock on the photos.

(a)(i) It may be edited by all users, so the data may disappear in the folder. ✓

(ii) The parents cannot change the position of the order form if they only can read it.

(iii) Setting a password for each student, and setting the privacy of students which means they cannot open it if not the referring student's account.

ai) 可能會被非教師或其他學校內部用戶於未經學校批准下
檢視、修改或刪減 內部資料夾和檔案



aii) 家長無法檢視

aiii) 只授予學生讀取資料夾班別的檔案,並把各個相片按照
學生的用戶密碼上鎖,從而令學生只可以查看資料夾班別
內自己的相片

7a i) 可能会遭到学生、家长恶意写入及修改 该资料夹



7a ii) 家长无法写入: 訂購表格.docx



7a iii) 将学生相片的读取权限于该名^{学校}学生或为相片加密把密码设定为该学生的身分证号码或电邮密码



ai, 所有用戶都可看到資料夾內的文件和內容, 可能會被偷取資料。



aii, 家長可能認為資料內容不夠全面和清晰。

aiii, 為每個學生的照片獨立開一個檔案並加上獨有的密碼, 並把獨有的密碼分別告訴學生。

(b) Alice considers the following two methods of sharing a network printer with all users.

Method 1: Connect the printer to a switch.

Method 2: Connect the printer to a workstation.

(i) Give an advantage of Method 1 over Method 2.

(1 mark)



(ii) Give an advantage of Method 2 over Method 1.

(1 mark)



(b) (i) The printer can still be used even though the workstation is off / out of order.

1

(ii) The user at the workstation has greater control over the printer.

1

Alternative:

The user at the workstation is allowed to use the printer and
can continue to use the printer even in the event of network issues /
can adjust the printer sharing options as needed.

(b)(i) Connecting the printer to a switch allow all the devices that are connected to the switch to access the printer where connecting it directly to a workstation only allow that workstation to access the printer.



(b)(ii) Connecting the printer to a workstation can have higher transfer speed to the printer compared to method 1.

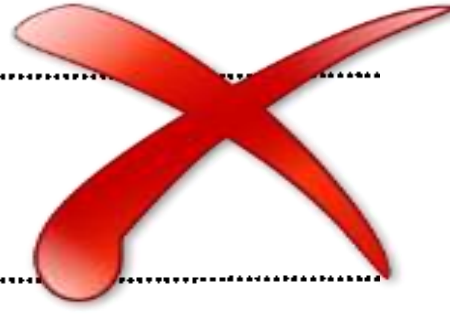
(b)(i) It can print it directly. for method 1.



(ii) It is safety, It can protect the user's information during printing.

bi) 可以更方便地透過同樣連接了交換器的電腦直接打印。

bii) 只要與打印機連接的網絡一致便可以打印



7bi) 无须互联网便可使用

7bii) 能同时连接更多打印机

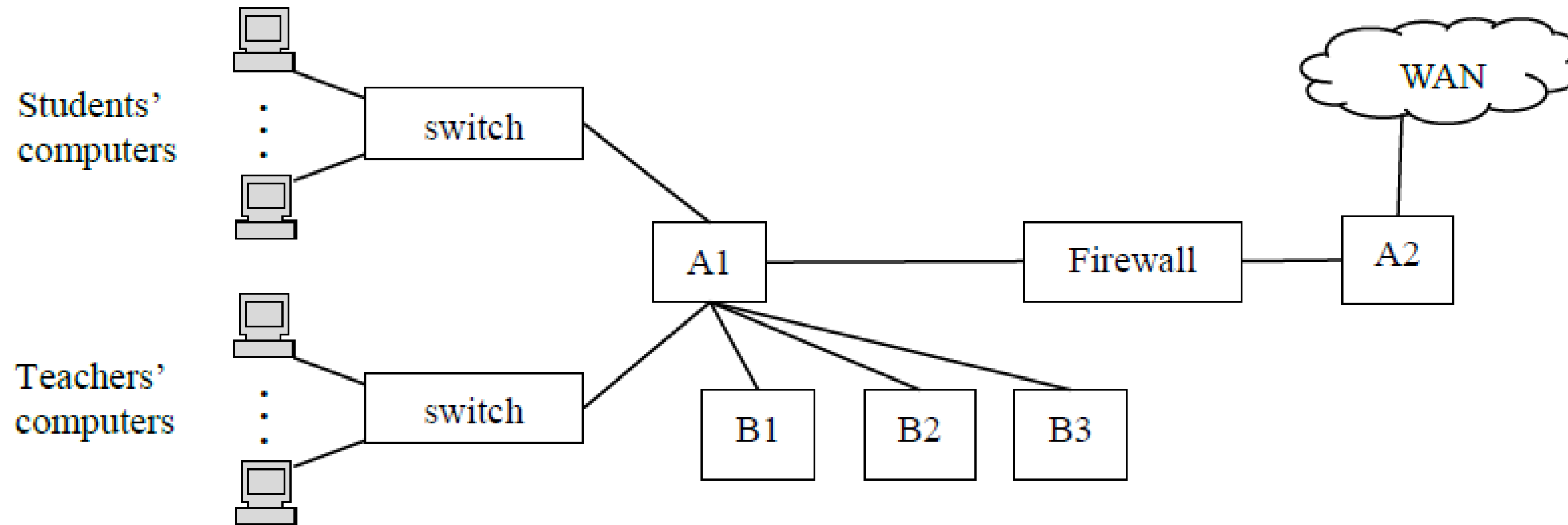


bi, 連接打印機至交換器，所分享的對象便可以無時無刻使用，比較方便。



bii, 有時閾限制，可保障私隱。

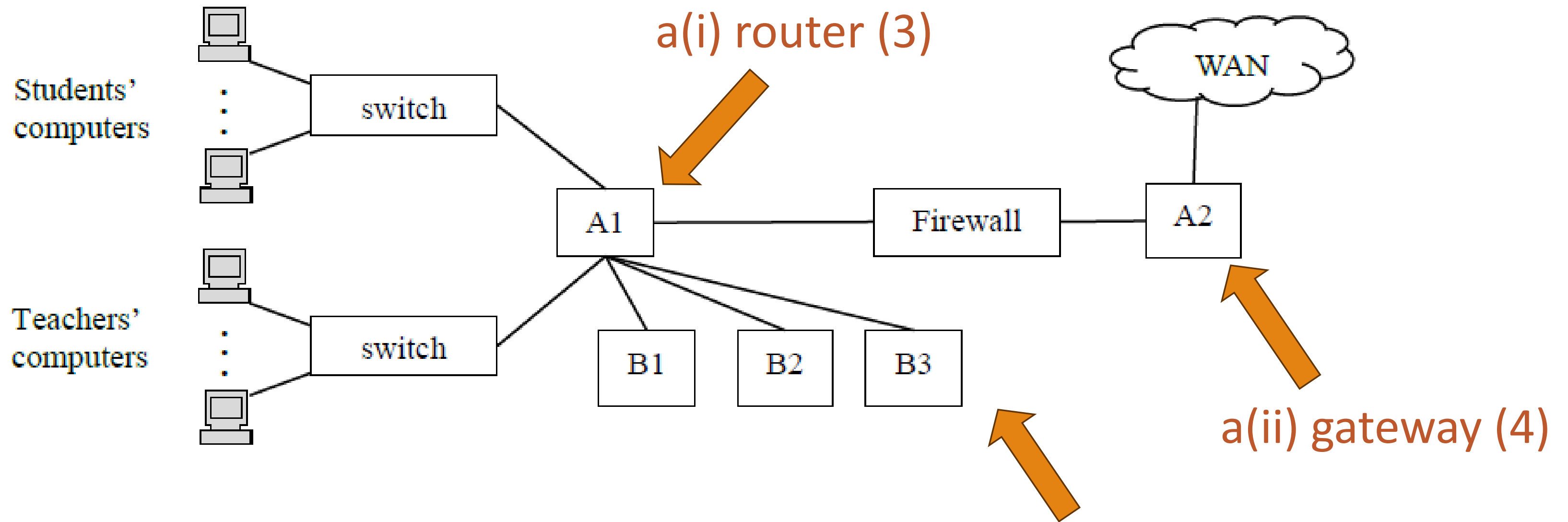
8. The network diagram for a school is shown below:



Each of the five different devices A1, A2, B1, B2 and B3 above has a distinct function, as shown below:

- (1) Authenticate users.
- (2) Handle HTTP requests.
- (3) Determine the path for data propagation.
- (4) Connect two networks with different protocols.
- (5) Manage the use of IP addresses including their lease duration.

8. The network diagram for a school is shown below:



Each of the five different devices A1, A2, B1, B2 and B3 above has a distinct function, as shown below:

- (1) Authenticate users.
- (2) Handle HTTP requests.
- (3) Determine the path for data propagation.
- (4) Connect two networks with different protocols.
- (5) Manage the use of IP addresses including their lease duration.

(b) Web server + (2)
Domain controller + (1)
DHCP server + (5)

- (a) (i) Which function from (1) to (5) should A1 have? (1 mark) ★★ ★
- (ii) Which function from (1) to (5) should A2 have? (1 mark)
- (b) Give the name of each of the following devices and its corresponding function from (1) to (5). ★
- (i) B1 (1 mark)
- (ii) B2 (1 mark)
- (iii) B3 (1 mark)

(a)	(i)	(3)	1
	(ii)	(4)	1
(b)	Any order for (i), (ii) & (iii)		1 × 3
	Web server + (2)		
	Domain controller + (1)		
	DHCP server + (5)		

vi) 4

ii) 3

b) i) Web server (2) ✓

ii) DHCP server (5) ✓

iii) Proxy server (1)

8a) i) 驗證用戶身份

ii) (4) 連接兩個使用不同協定的網絡

8b) i) 匯流排, (3) 判定數據傳播路徑

ii) 匯流排, (5) 管理 IP 位址的使用, 包括其租賃時段

iii) 路由, (2) 處理 HTTP 要求

9i) ~~(3)~~ (5) 管理 IP 位址的使用, 包括其租賃時段

ii) (4) 連接兩個使用不同協定的網絡

b) i) 驗證用戶身份

bii) (2) 處理 HTTP 要求

biii) ~~(3)~~ (3) 判定數據傳播的路徑

裝置的名稱?

9. Peter develops a homework checklist system for students in teams 1A, 2B and 3C. He creates a web page with `index.html`, an external CSS `style.css` and `gethw.php`, as shown below:

Homework checklist

Team:

1A

Select a team:

1A

2B

3C

Submit

style.css

```
Code
body {
    background-color: red;
}
form {
    background-color: green;
}
.teamList {
    background-color: yellow;
}
label {
    font-size: 12px;
    background-color: orange;
}
table,th,td {
    border : 1px solid black;
    border-collapse: collapse;
}
th,td {
    padding: 5px;
}
```

index.html

Line	Code
10	<head>
11	<link rel="stylesheet" type="text/css" href="style.css">
12	<script>
13	function createTeam(){
14	const team = ["1","2","3"];
15	let menu = document.getElementById("teamList");
16	for (i = 0; (b1) ; i++) {
17	let option = document.createElement("option");
18	temp = (b2)
19	option.text = team[i]+String.fromCharCode(temp);
20	option.value = team[i]+String.fromCharCode(temp);
21	menu.add(option);
22	}
23	}
24	</script>
25	</head>
:	:
:	:
100	<body onload="createTeam()">
101	Homework checklist
102	<form name="myForm" action="gethw.php" method="GET">
103	<p>Team:
104	<select id="teamList" name="q">
105	<option value="">Select a team:</option>
106	</select>
107	<input type="submit" value="Submit"></p>
108	</form>

- (a) (i) What is the background colour of the form on the web page? (1 mark)
- (ii) Modify Line 103 to change the font size of 'Team:' in the form to 16px. (1 mark)
- (iii) What is the use of `onload` on Line 100? (1 mark)



- | | | |
|---------|--|---|
| (a) (i) | Green / green / #00FF00 / rgb(0,255,0) | 1 |
| (ii) | <code><p style="font-size: 16px;">Team:</p></code>

Alternative: (HTML 4.01 Deprecated features)
<code><p>Team:</p></code> | 1 |
| (iii) | The <code>onload</code> event is commonly used within the <code><body></code> element to execute a script after a web page has fully loaded all its content, including images, script files and CSS files. | 1 |

Q(a)(i) Green

Q(a)(ii) `<p style="font-size: 16px"> Team:`

Q(a)(iii) To trigger the function `createTeam()` when the body element of the page is being loaded



ai) Green

ii) `<p style="font-size: 16px;">`



iii) To execute the line of code when the site is loading 

(a) (i) ~~绿色红色~~ 绿色.



(ii) 修改为: ~~<p style="text-size~~

~~<p style="text-size="16px">~~

(iii) 使网页主体加载时激活 Javascript 中的 createTeam
function.



9ai.) ~~绿色红色~~ 红色

9a(ii.) <p style="font-size: 16px" > 组别:

9a(iii.) 执行 "createTeam()"



9i') yellow

ii) font-size: 16px

iii) 用表运行 JAVA.



(b) (i) Write the missing part of Line 16.

(1 mark)



(ii) Given that the ASCII code of the character 'A' is 65, write the missing part of Line 18. (1 mark)

```
-----  
for (i = 0; (b1) ; i++) {  
    let option = document.createElement("option");  
    temp = (b2)  
    option.text = team[i]+String.fromCharCode(temp);  
    option.value = team[i]+String.fromCharCode(temp);  
    menu.add(option);  
}
```

(b) (i) b1: i <= 2

Alternative:

i < 3

i < team.length - 1

i <= team.length

(ii) b2: 65 + i

Alternative:

option.text = team[i] + String.fromCharCode(65+i);

(b) (i) $i < 3$



(ii) ~~$65+i$~~ ~~$64+i$~~ $65+i$



$96i$

$i < 3$



$96i$

~~$65+i$~~ ~~$64+i$~~ $const\ team[i]-1$

The homework checklist system connects to a database in a server. Homework data are stored in a database table HOMEWORK and some sample records are listed below:

HOMEWORK

DUE DATE	TEAM	SUBJECT	ITEMS
05-03-2025	1A	CHINESE	PROJECT
02-03-2025	1A	ENGLISH	WORKBOOK
22-04-2025	2B	MATHEMATICS	CORRECTION
05-04-2025	1A	MATHEMATICS	EXERCISE
⋮	⋮	⋮	⋮

gethw.php (called on Line 102 in index.html)

Line	Code
1	<?php
2	\$q = \$_GET['q'];
⋮	⋮
200	/* The four attributes of mysqli_connect are the hostname, login
201	name, password of the user and database name respectively. */
202	\$conn = mysqli_connect(\$dbhost, \$dbuser, \$dbpass, \$dbname);
203	if(!\$conn){
204	die("Failed: " . mysqli_connect_error());
205	}
206	\$sql = "SELECT * FROM HOMEWORK WHERE TEAM = '". \$q. "' (d1) ";
207	\$result = mysqli_query(\$conn, \$sql);
208	echo "<table>";
209	echo "<tr>";
210	echo "<th>DUE DATE</th>";
211	echo "<th>TEAM</th>";
212	echo "<th>SUBJECT</th>";
213	echo "<th>ITEMS</th>";
214	echo "</tr>";
215	while(\$row=mysqli_fetch_array(\$result)) {
216	echo "<tr>";
217	echo "<td>" . \$row['DUE DATE'] . "</td>";
218	echo "<td>" . \$row['TEAM'] . "</td>";
219	echo "<td>" . \$row['SUBJECT'] . "</td>";
220	echo "<td>" . \$row['ITEMS'] . "</td>";
240	echo "</tr>";
241	}
242	(f)
⋮	⋮
250	echo "</table>";
251	(g)
⋮	⋮
260	mysqli_close(\$conn);
⋮	⋮
300	?>

- (c) What is the use of the code from Lines 203 to 205? What will happen when Line 204 is executed? (2 marks) ★★ ★
- (d) The web page will show the homework records in ascending order of DUE DATE. Write the missing part of Line 206. (1 mark) ★★ ★

```

203  if (!$conn) {
204      die("Failed: " . mysqli_connect_error());
205  }
206  $sql = "SELECT * FROM HOMEWORK WHERE TEAM = '" . $q . "' (d1) ";

```

- | | | |
|-----|--|---|
| (c) | The code checks the <u>database connection / SQL server connection</u> . | 1 |
| | Executing Line 204 will <u>produce an error message / prevent the remaining scripts from running</u> if the connection to the MySQL server (database) fails. | 1 |
| (d) | ORDER BY DUE DATE <u>ASC</u> | 1 |

g(c) To return an error if the connection of the server to the SQL database has failed. ✓
Upon execution of line 204, the program would terminate itself and return an error. ✓
with the error details of the connection to the database.

c) To give a command to terminate the loading if the database fails to connect, if Line 204 is executed, it will say Failed: and kill the connection. ✓

d) ~~DUE DATE ORDER~~ ORDER BY DUE DATE ASC [^] attempt of ✓

(c) 203-205行的代码用于验证mysql连接是否成功，并在连接失败时~~返回~~输出返回的错误信息，并切断连接。
执行204行会打印“失败”✓
和mysqli函数返回的报错信息，然后强制断开连接。

(1). 检查PHP是否与**database**成功连接。
如果无法连接，则输出，失败：

9c) 若无法连接到数据库，则显示“失败mysqli_connect-
error”
检查是否成功连接数据库
↑
伺服器

```

if(  ) {
    echo "<td style='background-color:grey'>" . $row['ITEMS'] .
"</td>";
} else {
    echo "<td>" . $row['ITEMS'] . "</td>";
}

```



```

if(  ) {
    echo "<tr><td colspan=4>No homework</td></tr>";
}

```



(e) \$row['ITEMS'] == 'PROJECT'

Alternative:

```

Strcmp($row['ITEMS'], 'PROJECT')
$row['ITEMS'] === 'PROJECT'
str_contains($row['ITEMS'], 'PROJECT')

```

(f) \$mysqli_num_rows(\$result) == 0

Alternative:

```

empty(mysqli_num_row($result))
!mysqli_num_rows($result)

```

mysqli_num_rows(\$result) ①

mysqli_num_rows() == 0 ①

g) (e): \$row['ITEMS'] == 'PROJECT' ✓

g) (f): mysqli_num_rows() == 0 ✓

e) ITEMS = 'PROJECT' ✓

f) mysqli_num_rows() IS NULL ✓

g) ^{"ITEMS"}
~~Items~~ = "연구" ✓

e) in_array(\$row['ITEMS'], "연구"). ✗

f) mysqli_num_rows(\$result) == 0. ✓

```

$sql2 = "SELECT * FROM HOMEWORK";
$result = mysqli_query($conn, $sql2);
$subtotal = 0;
while($row = mysqli_fetch_array($result)) {
    if ( (g1) ) {
        $subtotal = $subtotal + 1;
    }
}
echo "The number of projects for Team 1A:" . $subtotal;

```



(h) What is the potential problem if Line 260 is deleted?

(1 mark)



| 260 | `mysqli_close($conn);`

- | | | |
|-----|---|-----|
| (g) | <code>\$row['TEAM'] == '1A' and \$row['ITEMS'] == 'PROJECT'</code>
<code>\$row['TEAM'] == '1A' && \$row['ITEMS'] == 'PROJECT'</code>

condition
all correct | 1,1 |
| (h) | Improperly closing database connections may result in
resource leaks / connection limits / performance issues / data integrity risks / security
vulnerabilities. | 1 |

g(g) (g1) : (\$row['ITEMS'] == 'PROJECT')
and (\$row['TEAM'] == '1A') ✓

g(h) The connection would persist if the program is
not terminated.

g) TEAM = '1A'

h) He will be unable to close the connection of the database

使用连接数据库后不关闭连接有机会受
黑客入侵或攻击。 ✓

(h) 可能会导致sql数据库连接一直开启, 容易被注入、攻击, ✓
造成安全问题。

Curriculum & Assessment Guide

b. Web Programming and Applications (24 hours)

ii. Web programming and applications

Learning Outcomes	Remarks
- Demonstrate simple client-side and server-side scripts. - Develop a simple web application.	Examples: - Process input data from clients (e.g. calculation on quadratic equation) - Simple data validation (e.g. check the range of numeric input) - Retrieve and update data from a single database table - Use of Cookies for storing of user information
	Students should be able to integrate client-side and server-side scripts to develop the application.
	Examples: - Search engine on restaurants in a shopping mall - Homework checklist for a class - Personal weight management system

- Scenarios in exam, not limit to the examples
- Of comparable difficulty to the examples
- Reference to the teaching materials provided by CDI

HKEAA HKDSE ICT Briefing 2025

Paper 2C – Algorithm & Programming



Revised ICT 2C Curriculum

- 1** **+ Python & C++**
- Pascal (2028), C & Java
- 2** **- Programming Languages**
- 3** **- Systems Development**
- 4** **+ Application of Programming in Real Life**

Assessment Principles for Algorithm & Programming

1

Pseudocode

- The focus is logical reasoning. Minor syntax error is accepted.
- Pseudocode has no standard syntax. Python / C++ / Pascal style is accepted.
 - ✓ e.g.1 – Assignment operators: $\leftarrow$ (Pastpaper) = (Python & C++) := (Pascal)
 - ✓ e.g.2 – Equal operators: = (Pastpaper & Pascal) == (Python & C++)

2

Python / C++ / Pascal

- The focus is also logical reasoning. Minor syntax error is accepted.
 - ✓ e.g.3 – Missing ; at the end of statement in C++ and Pascal
 - ✓ e.g.4 – Missing : at the end of if statement in Python
- Major syntax error and Logical error that affect logic or program flow are rejected.
 - ✗ e.g.5 – Pseudocode for whole program but Python / C++ / Pascal required
 - ✗ e.g.6 – Incorrect indentation in Python
 - ✗ e.g.7 – Missing Brackets for division like $(\text{left} + \text{right}) / 2 \rightarrow \text{left} + \text{right} / 2$

Paper 2C – Algorithm & Programming

10	Sorting	5M
11a	Merging 2 sorted arrays	2M
11b	Binary Search	3M
12	2D arrays Manipulation (Python, C++, Pascal)	5M
13	Constructive question	13M
13d	Application of Programming in Real-life (Sensors)	2M

The following algorithm has an integer array X with indices from 0 to $N-1$.

Line	Content
1	for i from 0 to $N - 2$
2	$s \leftarrow i$
3	for j from $i+1$ to $N - 1$
4	if $X[j] < X[s]$
5	$s \leftarrow j$
6	swap the content of $X[i]$ and $X[s]$

Assume that $N = 4$. The initial content of X is

k	0	1	2	3
$X[k]$	12	6	15	9

- (a) After executing Line 6 for the first time, what are the values of i and s ? (1 mark)
- (b) After executing Line 6 for the second time,
- (i) what is the value of s ? (1 mark)
- (ii) what are the values of $X[i]$ and $X[s]$? (1 mark)
- (c) What kind of sorting algorithm is it? (1 mark)
- (d) Briefly describe the changes that need to be made to the algorithm for reversing the sorting order. (1 mark)

- (a) $i = 0$ **1** ★★★★★
 $s = 1$
 (Remarks: 0 and 1 ✓ 1 and 0 ✗)
- (b) (i) $s = 3$ **1** ★★★★★
 (ii) $X[i] = 9$ **1** ★★★★★
 $X[s] = 12$
- (c) It is a selection sort (選擇排序). **1** ★★
- (d) '<' should be changed to '>' **1** ★★★★★
 (Remarks:
 For other answers, it is necessary to check if they work, such as
 line 1: for i from $N-1$ downto 1
 line 3: for j from 0 to $i-1$)

a) $i : 0$
 $s : 1$



b) 3



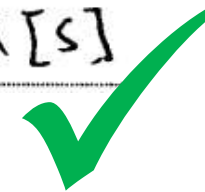
bii) 9 and 12



c) Selection sort in ascending order



d) line 4 should be changed to: if $x[j] > x[s]$



wrongly iterated i from 1

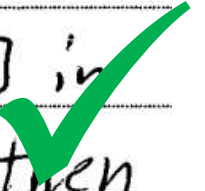
a) $i = 1, s = 1$ ✗

b) $s = 2$ ✗

bii) $x[i] = 6, x[s] = 15$ ✗

c) Sorting biggest to smallest ✗

d) You would need to change $x[j] > x[s]$ in line 4, this would mean j has to be bigger than s then after the swap the smallest would be ^{at} the front.



11a

P, Q and R are integer arrays and their first elements are P[0], Q[0] and R[0]. There are M and N elements in P and Q respectively. They are sorted in ascending order.

- (a) A subprogram is used to merge P and Q into a sorted array R in ascending order. The pseudocode for the subprogram is

```
i ← 0
j ← 0
while i < M (a1)
    if P[i] ≤ Q[j]
        R[i + j] ← P[i]
        i ← i + 1
    else
        R[i + j] ← Q[j]
        j ← j + 1
while i < M
    R[i + j] ← P[i]
    i ← i + 1
while j < N
    R[i + j] ← Q[j]
    j ← j + 1
```

and j < N

1

1



Write the missing part of the pseudocode.

(2 marks)

Logical Error

all or $j < N$

(a) (a1) AND $j < N$ AND $i+j < M+N-1$

Redundant but Logically Correct

(b) Another subprogram is used to determine whether `num` exists in `R` by using binary search. The pseudocode for the subprogram is

```

left ← 0
right ← M + N - 1
while left ≤ right
    middle ← (b1)
    if num = R[middle]
        output 'Found'
        exit subprogram
    else
        if num < R[middle]
            right ← (b2)
        else
            left ← (b3)
output 'Not found'

```

★★★★

Integral part of $(\text{left} + \text{right}) / 2$

1

Alternatives:

$(\text{left} + \text{right}) // 2$, $(\text{left} + \text{right}) / 2$
`int()` , `math.trunc()` , quotient of
`floor()` , `ceil()`
`round down()` , `round()` , `round up()`

Not accept: $\text{left} + \text{right} / 2$

`middle - 1`

1

★★★★

`middle + 1`

1

★★★★

Write the missing parts of the pseudocode.

(3 marks)

(b1) $\text{ROUNDUP}((\text{left} + \text{right}) / 2)$ ✓

(b2) $\text{middle} - 1$ ✓

(b3) $\text{middle} + 1$ ✓

Logical Error without ()

b1: $(\text{left} + \text{right}) / 2$ ✓

b2: middle ✗

b3: middle ✗

b)I) $\text{LEFT} + \text{RIGHT} / 2$ ✗

bII) $\text{middle} - 1$ ✓

bIII) $\text{LEFT} + \text{middle}$ ✗

In a number game program, the player guesses N numbers from 0 to 9. The program has the following global variables:

Variable	Description
ANS	An integer array for storing the answer
trial	A two-dimensional integer array for storing N guessed numbers for each trial
result	A two-dimensional character array for storing the correctness of the corresponding N guessed numbers for each trial 'T' – Right guess; 'F' – Wrong guess

Below is an example for $N = 3$. There are 4 trials, trials 0 to 3. `trial[0][2]` represents the third number in the first trial, which is 9.

ANS

0	1	2
3	7	8

trial

	0	1	2
0	7	7	9
1	8	8	4
2	3	8	4
3	3	7	8

result

	0	1	2
0	F	T	F
1	F	F	F
2	T	F	F
3	T	T	T

A subprogram `check(t)` is used to fill in `result` for trial `t`. Its pseudocode is

<u>Line</u>	<u>Content</u>
10	<code>check(t)</code>
20	<code>k ← 0</code>
30	<code>while k < (a1)</code>
40	<code>if (a2) = ANS[k]</code>
50	<code>result[t][k] ← 'T'</code>
60	<code>else</code>
70	<code>result[t][k] ← 'F'</code>
80	Part (b)
95	<code>k ← k + 1</code>

N 1 (x 3) ★★

trial[t][k] 1 ★★★★★
trial[t,k] ✓

(a) Write the missing parts of Lines 30 and 40.

(2 marks)

(a1) 3 ✗ No hardcoding

(a2) trial [t][k] ✓

a1) N ✓

a2) trial [t][k] ✓

On Line 80, a subprogram `hints(t, k)` is executed to display hints for a wrong guess `trial[t][k]`, as shown below:

- Case A: There had been a right guess in a previous trial.
- Case B: This wrong guess is the same as the wrong guess in a previous trial.

For example,

	Display	Reason
<code>hints(2,1)</code>	Case A	There had been a right guess in trial 0 (number 7)
<code>hints(2,1)</code>	Case B	This wrong guess is the same as the wrong guess in trial 1 (number 8)
<code>hints(2,2)</code>	Case B	This wrong guess is the same as the wrong guess in trial 1 (number 4)

Referring to the example above, the output for `check(2)` is

```
t=2 k=1 Case A
t=2 k=1 Case B
t=2 k=2 Case B
```

Assume that `N` is a global variable. Write `hints(t, k)` in Python, C++ or Pascal. State the programming language used in your answer. (3 marks)



- Traverse all trials (i from 0 to t-1) 1
✗ access out of boundary
- Able to check Case A in one trial 1
- Able to check Case B in one trial 1
✗ `trial[t-1][k]==trial[t][k]`
- Major Syntax error & 3 marks awarded -1

Sample Scripts

```
def hints(t, k):
    for i in range(0, t):
        if result[i][k] == T:
            print("t=", t, "k=", k, "情况A")
        if trial[i][k] == trial[t][k]:
            print("t=", t, "k=", k, "情况B")
```

hints(t, k)

~~Base A~~ $t_i = t$ ✗ Cannot traverse 0 to t-1

while $t_i \geq 0$ ← Minor Syntax Error (: , ==)

if $result[t_i][k] = "T"$

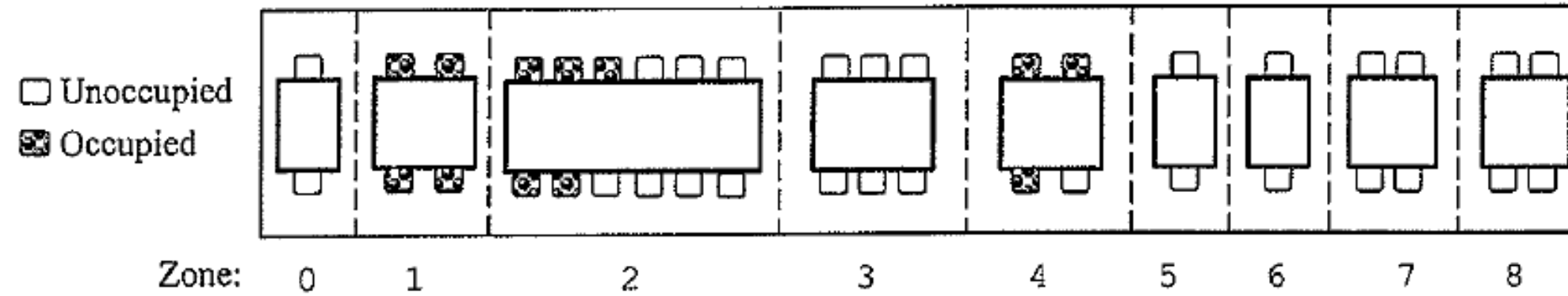
print("t=" ~~t~~ t, "k=" k, "Case A") ✓

$t_i = t_i - 1$ ← Major Syntax Error (Indentation)

if $trial[t][k] = trial[t-1][k]$ ✗ Only checked the last trial

print("t=" t, "k=" k, "Case B")

13. In a restaurant, there are 20 two-seat tables allocated in different zones. In the following example, there are 9 zones (0 to 8). Zone 1 consists of two fully occupied tables. Zone 2 consists of 6 tables and 5 out of 12 seats are occupied.



The restaurant uses a program with the following global variables to arrange seats for customers:

Variable	Description
cap	An integer array for storing the total number of seats in each zone
avail	An integer array for storing the number of unoccupied seats in each zone
zn	An integer variable for storing the number of zones

Referring to the example above, the contents of the variables are

i	0	1	2	3	4	5	6	7	8
cap[i]	2	4	12	6	4	2	2	4	4
avail[i]	2	0	7	6	1	2	2	4	4
zn	= 9								

A subprogram `findZone(c)` is used to return a zone `i` for `c` customers. It returns the smallest zone `i` such that `avail[i] >= c` and `avail[i]` is the closest value to `c`. If no zone can be found, it returns `-1`.

Referring to the example above, when `c = 4`,

`avail[i] >= 4` for `i = 2, 3, 7, 8`
`avail[i]` is the closest value to 4 for `i = 7, 8`

Hence, `findZone(4)` will return the smallest zone 7.

13a

- (a) (i) Referring to the example above, give the return value of `findZone(6)`. (1 mark)

The pseudocode for `findZone(c)` is

```

findZone(c)
  zone ← -1
  for i from 0 to zn - 1
    if avail[i] ≥ c
      if zone = -1
        (a1)
      else if avail[i] (a2)
        zone ← i
  return zone

```

- (ii) Write the missing parts of `findZone`. (3 marks)

(a) (i) 3 (1) ★★★★★

(ii) a1: zone ← i (1) ★★★★★

a2: < avail[zone] ★★★

(1)

(1)

(Remarks: zone = i accepted)

13a

Sample Scripts

ai)

ai. 3 ✓

a)!) 3 ✓

ai) findZone (6) 的傳回值是 3 ✓

a ii)

Python / C++ style accepted

a1. zone = i ✓

a2. < avail[zone]
✓ ✓

a1) continue the loop ✗

a2) < = avail[zone]
✗ ✓

13b

The restaurant aims to combine zones to serve large groups of customers. Only adjacent zones without customers can be combined.

A subprogram `comZone(c)` is used to display the zones i to j to be combined for c customers with the smallest value i such that

$$(\text{avail}[i] + \text{avail}[i+1] + \dots + \text{avail}[j]) \geq c$$

Referring to the example above, `comZone(7)` will display 'Combine zones: 5 to 7'.

The pseudocode for `comZone(c)` is

```

comZone(c)
  i ← 0
  cnt ← 0
  for j from 0 to zn - 1
    if avail[j] = cap[j]
      cnt ← cnt + (b1)
      if cnt (b2)
        output 'Combine zones: ', i, ' to ', j
        exit comZone
    else
      cnt ← (b3)
      i ← (b4)

```

(b) Write the missing parts of `comZone`.

(4 marks)

(b) b1: `avail[j]` or `cap[j]` 1 ★★★★★

 b2: `>= c` 1 ★★★★★

 b3: 0 1 ★★★★★

 b4: $j + 1$ 1 ★

(Remarks: ✗ $i+1$)

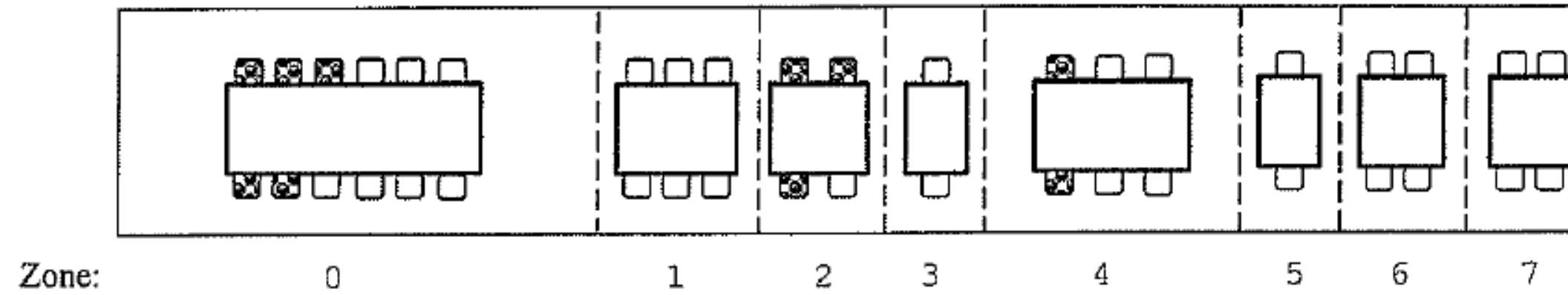
b1.	avail[j]	✓
b2.	$\geq c$	✓
b3.	0	✓
b4.	$j+1$	✓

b1)	avail[j]	✓
b2)	$\geq c$	✗
b3)	avail[j]	✗
b4)	$j+1$	✗

The restaurant aims to split a zone into multiple zones with the following rules:

1. Only zones with customers need to be split.
2. For each zone i with customers, k unoccupied two-seat tables are split and k new zones are created on the right side.

For example,



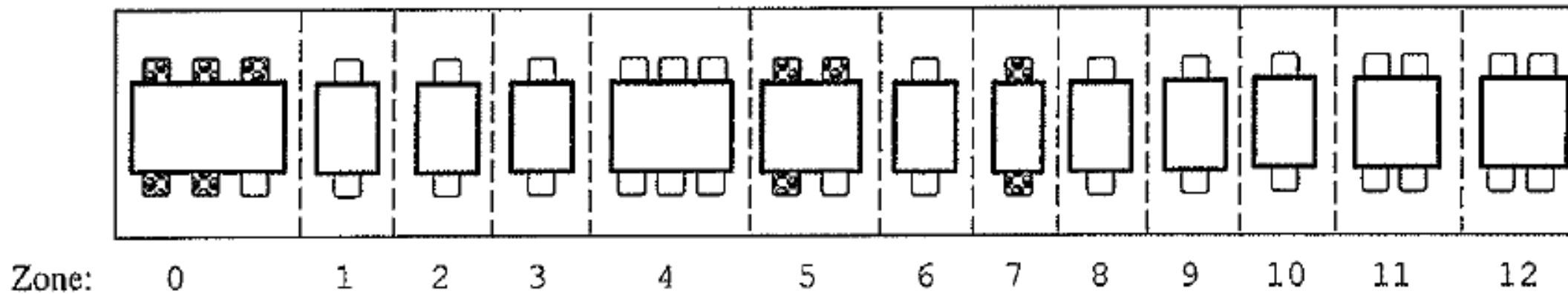
According to the second rule above :

for $i = 0, k = 3$

for $i = 2, k = 0$

for $i = 4, k = 2$

After splitting, the zones are renumbered:



i	0	1	2	3	4	5	6	7	8	9	10	11	12
cap[i]	6	2	2	2	6	4	2	2	2	2	2	4	4
avail[i]	1	2	2	2	6	1	2	0	2	2	2	4	4

zn = 13

A function `floor(n)` returns the integral part of `n`. For example, `floor(0.5)` returns `0`. A subprogram `splitZone` is used to split zones and its pseudocode is

```

splitZone
  cnt ← 0
  for i from 0 to zn - 1
    if cap[i] (c1) avail[i]
      k ← floor(avail[i]/2)
      temp ← (c2)
      new_cap[cnt] ← cap[i] - temp
      new_avail[cnt] ← avail[i] - temp
      cnt ← cnt + 1
      for j from 0 to (c3)
        new_cap[cnt] ← 2
        new_avail[cnt] ← 2
        cnt ← cnt + 1
    else
      new_cap[cnt] ← cap[i]
      new_avail[cnt] ← avail[i]
      cnt ← cnt + 1
  cap ← new_cap
  avail ← new_avail
  zn ← (c4)

```

(c) c1: > or <> or != 1 ★★☆☆

 c2: k * 2 1 ★★

 c3: k - 1 2 ★★(① k only)

 c4: cnt 1 ★★★★★

(c) Write the missing parts of `splitZone`.

(5 marks)

Sample Scripts

c1. > ✓
c2. 2*k ✓
c3. k-1 ✓
c4. cnt ✓

(c)(1) > ✓
(2) k*2 ✓
(3) k ✓
(4) zn+cnt ✗

c1) < ✗
c2) 2*k ✓
c3) cnt-1 ✗
c4) len(cap) ✓

Python style accepted

(d) Describe two different sensors that can be used to estimate the number of seats occupied. (2 marks)

(d) Description of
Ultrasonic sensor / Light sensor / Infrared sensor / Motion sensor /
Force pressure sensor / Touch sensor / Temperature sensor ...

★ ★
1 x 2

(Remarks: Reasonable sensors with brief description of the usages
eg1. Ultrasonic sensor can detect the change of distance
eg2. Light sensor can detect the change of light intensity
eg3. Temperature sensor can detect a human body temperature)

Sample Scripts

d) 紅外線傳感器 ✖

溫度傳感器 ✖

No description

d) Infra-red motion sensor, detect if the seat under the sensor is occupied ✖

Meaningless descriptions

camera, to see if there ^{are} any ~~po~~ people in the seats ✖

d) Ultrasonic sensor, measure the distance from the seat and the sensor from the upside (sensor) to the downside (seat), check whether there is a body (obstacle) ✓

temperature sensor. Check whether there is a body with a normal body temperature ✓

Descriptions with the usages

Thank You

