FUKIEN SECONDARY SCHOOL

S5 Final Examination (2020-2021)

Information and Communication Technology

Paper 1 (Section B)

(2 hours)

Date: 21st June 2021 Name:_____

Time: 8:30a.m. - 10:30a.m. Class: _____ No.: _____

INSTRUCTIONS

1. When told to write your name, class and class number, write them on section A, section B as well as the multiple-choice answer sheet.
2. **ANSWER ALL QUESTIONS.** Write your answers in the spaces provided in this Question-Answer book. Do not write in the margins. Answers written in the margins will not be marked.
3. Supplementary answer sheets will be supplied on request.
4. There will be an appendix with a list of SQL commands and spreadsheet functions which you may find useful.

1. Eva plans to improve the system software in a software product.

   (a) Give **two** major differences between system software and application software.

   _____

   _____

   _____

   _____

   (2 marks)

   Eva writes an algorithm involving integers, as follows:

Line number	Content
10	`Input A, B`
20	`Repeat`
30	`    If A < B then`
40	`        T ← A`
50	`        _____ ← _____`
60	`        _____ ← _____`
70	`        A ← Remainder of (A/B)`
80	`Until (A = 0 or B = 0)`
90	`Output (A + B)`

   (b) Lines 40 to 60 are used to swap the contents of `A` and `B`. `T` is a temporary variable. Complete the pseudocode above.

   (2 marks)

   (c) (i) Suppose that the input values for `A` and `B` are 9 and 15 respectively. Write down the contents of `A` and `B` after each pass on Line 80.

Iteration	A	B
First		
Second		
Third		

   (3 marks)

   (ii) Suppose that the input values for `A` and `B` are the same positive integer. How many times will Line 80 be executed?

   _____

   (1 mark)

(d) Eva adds the following pseudocode after Line 10 to ensure that the initial values for `A` and `B` are positive. Complete the pseudocode.

```
While (A _____ 0) _____ (B _____ 0) do
    output "Invalid input!"
    Input A, B
```

(3 marks)

(e) Eva writes Lines 30 to 70 using an '`If-then-else`' statement, as shown below. Complete the statement below.

```
If A < B  then
          B ← _____________________________
else
          A ← _____________________________
```

(2 marks)

2. Ms Wong uses the following spreadsheet to store the list of participating students in an athletics meet:

	A	B	C	D	E
1	Student ID	English name	Chinese name	Year of birth	Grade
2	8101	Wong Siu Fun	王小芬	2003	
3	8102	Chan Cheung Tai	陳長大	2005	
4	8201	Lee Li Li	李莉莉	2006	
5	8202	Wong Ka Yee	黃嘉儀	2003	
⋮	⋮	⋮	⋮	⋮	⋮
1000	6427	Cheung Yat Man	張一文	2002	
1001	6428	Cheung Yee Man	張二文	2002	
1002					
1003	Grade	Number of Students			
1004	A				
1005	B				
1006	C				

(a) The grade of a student is defined by the year of birth, as shown below:

Year of birth(Y)	Grade
Y<2004	A
2004≤Y≤2005	B
2005<Y	C

(i) Ms Wong uses column E to store the grade of each student. She enters a formula in E2 and then copies it to E3:E1001. Complete the formula in E2.

=IF(D2<_____,"A",IF(D2>_____,"_____","_____"))

(4 marks)

(ii) Ms Wong uses B1004: B1006 to store the total number of students in each grade. She enters a formula in B1004 and then copies it to B1005:B1006. Write the formula in B1004.

_____

(2 marks)

Based on the spreadsheet, a database table, STUDENT, is created. Part of STUDENT is shown below:

STUDENT

SID	ENAME	CNAME	YEAROFBIRTH	GRADE	EVENT
8101	Wong Siu Fun	王小芬	2003	A	100M
8102	Chan Cheung Tai	陳長大	2005	B	100M
8102	Chan Cheung Tai	陳長大	2005	B	Shot put
8201	Lee Li Li	李莉莉	2006	C	100M
8202	Wong Ka Yee	黃嘉儀	2003	A	100M

(b) (i) Give an example to illustrate why SID + ENAME cannot be the primary key for STUDENT.

_____

_____

(1 mark)

(ii) Give the primary key for STUDENT.

_____

(1 mark)

(c) Based on the five records given in STUDENT, what is the output after executing the following SQL command?

```
SELECT GRADE, EVENT, COUNT (*) FROM STUDENT GROUP BY GRADE, EVENT
```

(2 marks)

(d) Ms Wong has a presentation file about the athletics meet that contains texts and images.

(i) Suggest **two** ways of editing the file to make the presentation attractive.

_____

_____

_____

_____

(2 marks)

(ii) Ms Wong plans to insert the spreadsheet into this presentation file to show the updated list participating students. Explain how she can use Object Linking and Embedding (OLE) to complete the task.

_____

_____

_____

_____

(2 marks)

3. John helps a clinic to modernize its IT equipment.

(a) John installs a web camera in the waiting area for security purposes.

(i) John chooses to use MP4 format instead of AVI format to create a backup of the videos captured by the web camera. Give one reason to support his choice.

_____

_____

(1 mark)

(ii) John finds that a 1-minute video takes up approximately 10 MB. Calculate the required storage capacity of a daily in GB. Show your calculation.

_____

_____

_____

_____

(2 marks)

(iii) A doctor can view a video in the daily backup through the Internet when out of the clinic. Briefly describe how the video file is transmitted over the Internet with the reference to the concepts of data packets and the Internet Protocol (IP).

_____

_____

_____

_____

(2 marks)

(iv) A doctor in his consultation room can view the waiting area. Give **two** technical issues relating to streaming that John should consider when designing a streaming service.

_____

_____

_____

_____

(2 marks)

(b) Describe **two** things John should consider when setting up a new lighting system and curtains in the clinic with reference to ergonomics of the workplace for using computers.

_____

_____

_____

_____

(2 marks)

(c) John installs an electronic lock on the door of the consultation room. The doctor can use his fingerprint or a smart card to open it.

(i) Suggest another biometric authentication method which can be used to open a door.

_____

(1 mark)

(ii) Give **two** disadvantages of using the smart card instead of biometric authentication methods to open the door.

_____

_____

_____

_____

(2 marks)

4. In a school, Mr Li develops an interactive e-learning platform. Students can use a smart phone to access the platform and participate in some e-learning activities.

   (a) The e-learning activities include an element of interaction. Describe **two** examples of the activities.

   _____

   _____

   _____

   _____

   _____

   _____

   (4 marks)

   (b) Mr Li orders some desktop computers so that students who forget to bring their smart phones can still participate in the e-learning activities. Give **two** advantages of desktop computers over smart phones.

   _____

   _____

   _____

   _____

   (2 marks)

   (c) After completing the activities, students have to submit a report to Mr Li.

   (i) The reports can be in either text format or PDF format. Give **two** advantages of using text format over PDF format.

   _____

   _____

   _____

   (ii) Mr Li can ask students to submit the reports through either email or a school network drive. Give one advantage of each method.

   Email: _____

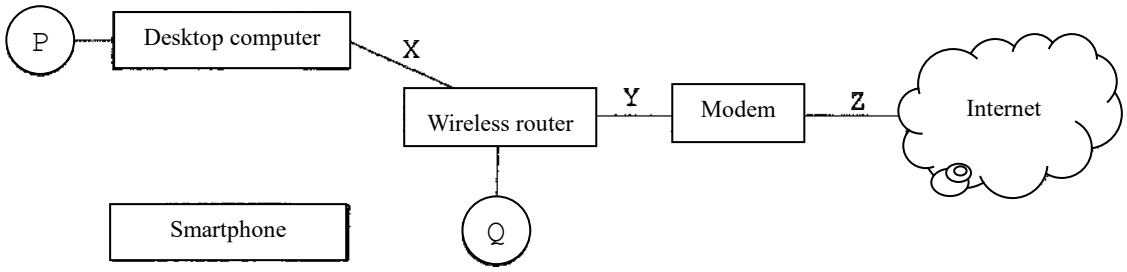
   _____

   School network drive: _____

   _____

   (4 marks)

5. John wants to set up a local area network with a desktop computer, a smartphone and a printer at home, as shown below:



(a) (i) John connects the printer to the network at P instead of Q. What is the advantage and disadvantage of this?

Advantage: _____

_____

Disadvantage: _____

_____

(ii) The printer is equipped with RAM and ROM. When John prints a document, what will the RAM and ROM store?

(1) RAM _____

(2) ROM _____

(4 marks)

(b) (i) Suggest **two** possible ways to link up the desktop computer and the smartphone.

_____

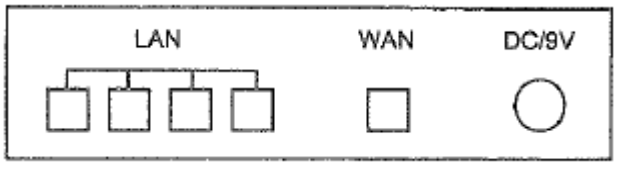
_____

(ii) X and Z are two different cables. What is the major difference in functional characteristic between them?

_____

(3 marks)

(c) The rear part of the router is shown in the diagram below. Mark 'X' and 'Y' on the diagram to indicate where the cables X and Y should be connected.



(2 marks)

(d) Someone suggests John build a Domain Name System (DNS) to improve his network services. John disagrees with this suggestion.

(i) What network service does a DNS mainly provide?

_____

_____

(ii) Do you agree with John's view? Explain briefly.

_____

_____

(2 marks)

END OF PAPER

Appendix

Database (SQL commands – based on SQL–92 Standard)

Constants	TRUE, FALSE
Operators	+, –, *, /, >, <, =, >=, <=, <>, %, _ , ' , AND, NOT, OR
SQL	ABSOLUTE (ABS), AVG, INT, MAX, MIN, SUM, COUNT, AT, CHAR_LENGTH (LEN), LOWER, TRIM, SPACE, SUBSTRING (SUBSTR/MID), UPPER, AS, BETWEEN, BY, ASC, DESC, DISTINCT, FROM, GROUP, HAVING, LIKE, NULL, ORDER, SELECT, WHERE

Electronic Spreadsheet

Constants	TRUE, FALSE
Operators	+, –, *, /, <, >, =, <>, <=, >=
Functions	ABS, INT, RAND, SQRT, ROUND, AND, NOT, OR, CHAR, CONCATENATE (&), ISBLANK, LEFT, LEN, LOWER, MID, PROPER, RIGHT, TEXT, TRIM, UPPER, VALUE, AVERAGE, COUNT, COUNTA, COUNTBLANK, COUNTIF, MAX, MIN, RANK, SUM, SUMIF, FIND, VLOOKUP, IF