

FUKIEN SECONDARY SCHOOL
S4 Final Examination (2020-2021)
Information and Communication Technology
(1 hour 30 minutes)

Date: 9th June 2021

Name: _____

Time: 8:30 a.m. - 10:00 a.m.

Class: _____ No.: _____

INSTRUCTIONS

1. Write your name, class and class number on both the MC answer sheet and this Question-Answer Book.
2. Answer all questions. You are advised to use an HB pencil to mark all the MC answers on the MC answer sheet. Write your answers in the spaces provided in this Question-Answer Book.
3. Hand in the MC answer sheet and this Question-Answer Book at the end of the test.
4. The total mark of this paper is 100.
5. Candidates are allowed to use a calculator which has been pad-printed with the 'H.K.E.A.A. APPROVED' or 'H.K.E.A. APPROVED' label.

Section A – Multiple Choice Questions (40 marks)

1. Which of the following is **not** appropriate for enhancing students' information literacy?
- A. Watching documentaries about the ocean online
 - B. Searching for the installation password of a software package through an online discussion forum
 - C. Reading school newsletters through the school intranet
 - D. Finding the history of computers through the Internet
2. In a data transmission system, a parity check is applied. Which of the following received codes is invalid?

- A. 0101 0101
- B. 1000 0100
- C. 1111 0001
- D. 0000 0011

3. A computer user wrongly types the month as 7 instead of 12. In order to detect the mistake, which of the following tasks should be conducted?

Date of Birth: / /

- A. Range check
 - B. Odd parity check
 - C. Even parity check
 - D. Data verification
4. Which of the following decimal values is equivalent to 1010 0001 in 8-bit two's complement representation?
- A. 33
 - B. -33
 - C. 95
 - D. -95
5. Which of the following character sets can be used to represent simplified Chinese characters, traditional Chinese characters and English characters?

- (1) ASCII
- (2) Unicode
- (3) GB code

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

6. In a law firm, the lawyers need to read many archive documents every day. The firm plans to scan and store its archive documents as digital images so that the lawyers can use computers to search and view the documents. The law firm uses optical character recognition (OCR) technology to convert digital images into document files. Which of the following attributes can highly affect the accuracy of the conversion during the scanning process?
- A. DPI (dots per inch) resolution
 - B. Colour depth
 - C. File format
 - D. Image size
7. Mary produces daily sales reports for a supermarket on a word processor, using the data and charts stored in several spreadsheet files. The data and charts are updated frequently. Which of the following is most helpful to her?
- A. Mail merge
 - B. 'What-if' scenarios
 - C. Object linking and embedding
 - D. SQL
8. Mr. Lee wants to set up a cleaning service company to serve thousands of clients. He needs to process data about the service and create a monthly report for each client. Which software should he buy?
- A. Word processing software
 - B. Spreadsheet software
 - C. Presentation software
 - D. Database software
9. Mary sends an email with a document in PDF instead of DOC format. What is/are the possible reason(s) for this?
- (1) The document can be encrypted.
 - (2) The page layout of the document can be preserved.
 - (3) Multimedia elements can be included.
- A. (1) only
 - B. (2) only
 - C. (1) and (3) only
 - D. (2) and (3) only
10. In order for a factory manager to decide on the number of machines to be bought to produce pencils, he needs to consider time and cost constraints. What spreadsheet feature should he use to do this?
- A. Pivot table
 - B. Multiple worksheets
 - C. 'What-if' scenarios
 - D. Sorting data using multiple criteria

11. Peter creates Chart 1 in a spreadsheet file. He wants to modify Chart 1 so that it becomes Chart 2. Which chart setting should he change?

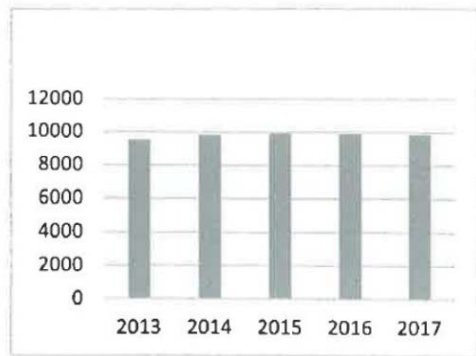


Chart 1

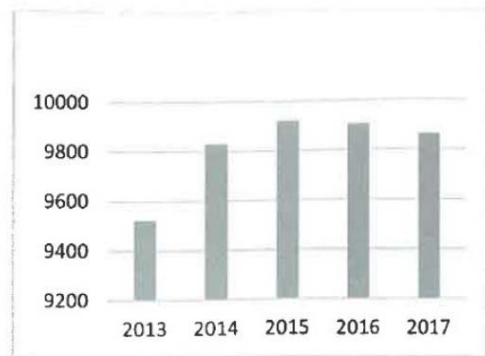


Chart 2

- A. Legend
 B. Data source
 C. Axis
 D. Chart type
12. Refer to the following database table STUDENT.

STUDENT

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

⋮

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

- (1) Integer
 (2) Character
 (3) Boolean
- A. (1) only
 B. (2) only
 C. (1) and (3) only
 D. (2) and (3) only
13. Which of the following statements about mail merge is correct?

- A. Only one file is needed in each mail merge.
 B. Mail merge is mainly used for sending email.
 C. Data can be sorted and filtered for a mail merge.
 D. Mail merge usually involves presentation software.

14. A database table PROD has seven records, as shown below:

PNAME	WEIGHT	PSTAT
SALT	1	A
SUGAR	1	P
SHAMPOO	1	P
TOOTHPASTE	3	P
ORANGE	4	S
CHARCOAL	5	P
NOODLES	6	S

What would be the output after executing the following SQL command?

```
SELECT MAX(WEIGHT) FROM PROD WHERE PSTAT <> 'S'
```

- A. 1
- B. 5
- C. 6
- D. 11

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

- A. Template
- B. Slide layout
- C. Insertion of pictures
- D. Index

16. The following table shows the specifications of computers X, Y and Z. All computers use the same operating system.

	X	Y	Z
CPU	Quad-core, 2.8 GHz	Dual-core, 1.8 GHz	Quad-core, 2.4 GHz
RAM	4 GB	2 GB	4 GB
Storage device	2TB hard drive	512 GB SSD	512 GB SSD
Network	LAN port (1000 Mbps)	802.11ac WiFi	LAN port (1000 Mbps) 802.11ac WiFi

Which computer(s) has/have the best computational power?

- A. X
- B. Y
- C. Z
- D. Y and Z

17. Consider the following instruction.

Address	Instruction	Description
1000	STORE 1111	Store the content of the accumulator into the main memory with the address 1111

In the fetch-decode-execute cycle, what does 'fetch' do?

- A. It obtains the instruction from the main memory with the address 1000.
- B. It obtains the instruction from the main memory with the address 1111.
- C. It obtains the content of the accumulator.
- D. It calculates the address of the next instruction by using the control unit (CU).

18. Peter has an e-ticket for a concert, as shown below:

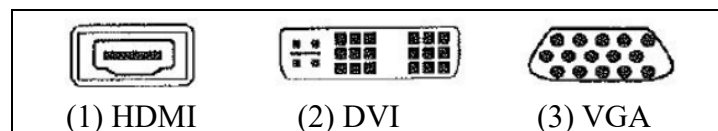


Which of the following statements about the barcode on the e-ticket is/are correct?

- (1) Information on the barcode may be decoded even if part of the barcode is damaged.
- (2) Only one type of data, such as numeric data, can be encoded at a time.
- (3) The barcode can be scanned successfully in a maximum of three directions.

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

19. A TV unit has the following three ports. High Definition (HD) videos will be output to the TV unit. Which of the following ports should be used?



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

20. Arrange the following in ascending order by data transfer rate.





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

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

Section B – Structured Questions (60 marks)

1. Mary buys a new computer.

Her computer consists of the following hardware components: P, Q, R and S.

			
P	Q	R	S

- (a) (i) (1) Which one is a RAM? _____ (2) Which one is a hard disk? _____

- (ii) RAM and hard disk have similar function. What is it?

- (iii) RAM and hard disk have different property. Which property can be demonstrated when the computer is powered off?

- (iv) Besides input and output peripheral devices, give **two** essential hardware components connected to the main board of the computer, of which the main functions are different from (a)(ii).

(1) _____ (2) _____ (6 marks)

- (b) Mary is editing a document, sample.doc, on a cloud application. Suddenly, the Internet connection is disconnected for a short while. Afterwards, Mary re-logs to the website.

- (i) In order to minimize the data loss when Internet service is interrupted, what function is usually provided in a cloud application?

- (ii) Describe briefly how the function in (b)(i) works.

(2 marks)

2. Sarah is a teaching assistant in a secondary school. She creates a table, STUD, to store the examination scores of all the students in a database.

STUD

Field	Field name	Description
1	REGNO	Registration number
2	CLASS	Class
3	CNO	Class number
4	ENAME	English name
5	CNAME	Chinese name
6	CHI	Chinese language score
7	ENG	English language score
8	MATH	Mathematics score

- (a) (i) Should Sarah use CNO as the key field of STUD? Explain your answer briefly.

- (ii) Suggest another field name stated in the above which can act as the key field of STUD.

(3 marks)

- (b) (i) Sarah executes a SQL command on STUD with four records as shown below.

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

STUD

REGNO	CLASS	CNO	ENAME	CNAME	CHI	ENG	MATH
20171001	4B	10	Thomas	海靜	80	90	70
20171002	4E	15	Andy	黃顯貴	70	60	80
20171003	4F	20	Marcus	惠藍	50	60	100
20161001	5C	8	Carlos	于鶴其	50	60	70

What is the output?

Write SQL commands to complete the tasks in (b)(ii), (iii) and (iv).

- (ii) List the CLASS, CNO, ENAME and CHI of the STUD.

- (iii) List the highest mark of MATH of the STUD.

- (iv) List the registration numbers of all form 1 students.

(11 marks)

- (c) Suggest **two** more fields that usually store for students' data.

(2 marks)

- (d) Suggest a type of chart to compare the subject scores of the students.

(1 mark)

- (e) Suggest one data validation method for 'CHI' field. Explain your answer briefly.

(2 marks)

- (f) Sarah copies the records in STUD into a spreadsheet.

	A	B	C	D	E	F
1	REGNO	CHI	ENG	MATH	WEIGHTED	GRADE
2	20171001	80	90	100		
3	20171002	70	50	30		
4	20184001	40	50	30		
5	20184002	70	80	90		
6	AVG					
7	MAX					
8	MIN					

- (i) Sarah wants to use column E to store the weighted score of the three subjects. She enters a formula into E2 and then copies it into the other cells. The formula is shown below:

$$\text{WEIGHTED} = \text{CHI} \times 0.3 + \text{ENG} \times 0.4 + \text{MATH} \times 0.3$$

Write the formula in E2.

- (ii) Write a formula in cell B6 to find out the average mark of Chinese. The formula will then be copied to C6 and D6.

- (iii) Sarah has created a lookup table in cell A11 to B14.

	A	B	C
10	MARK	GRADE	DESCRIPTION
11	0	D	FAIL - Less than 50
12	50	C	PASS - 50 to 64
13	65	B	CREDIT - 65 to 84
14	85	A	DISTINCTION - Over 85

Fill in the formula in cell F2 in below to find the grade for each student.
The formula will then be copied to F3 and F5.

=VLOOKUP(_____ , _____ , _____ , _____)

(5 marks)

3. Mr. Cheung has an old computer in his office. He asks Rooney, a technician of the company, to replace the CPU of his computer with another CPU with a higher clock rate because he is not satisfied with the performance of the computer.

(a) The following are the procedures for Rooney to install the new CPU:

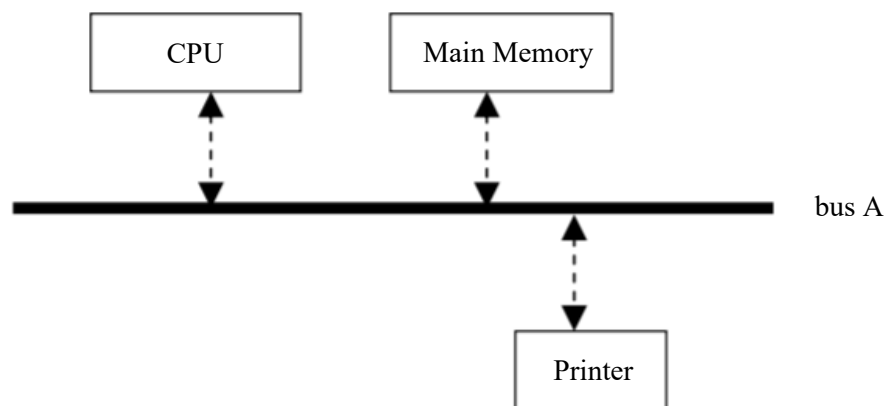
- (1) Open the case.
- (2) Close the case.
- (3) Replace the CPU.
- (4) Turn off the computer.
- (5) Wear a wrist strap and connect it to the ground.
- (6) Disconnect the computer from the power socket.

Arrange the procedures in a correct order.

_____ → _____ → 5 → _____ → _____ → 2

(2 marks)

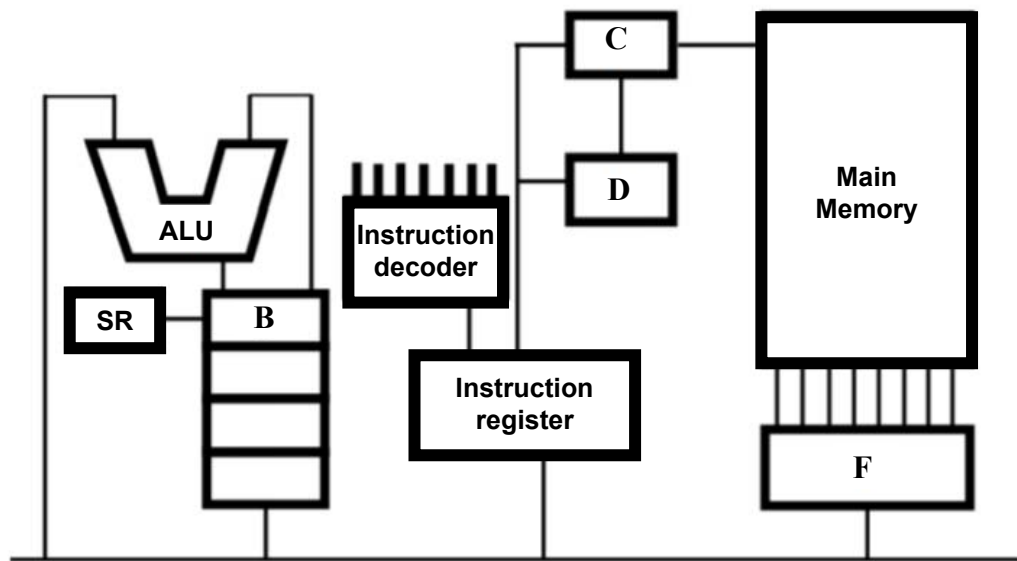
(b) Mr. Cheung's computer has the following design:



Except control bus, which **two** kinds of buses can bus A be? What are the functions of these two kinds of buses?

(4 marks)

The following diagram shows the structure of CPU and Main Memory.



(c)(i) CPU consists of two main components. What are they?

(2 marks)

(ii) Give the names of register B and D. Briefly describe their functions in a machine cycle.

(4 marks)

4. Mary wants to buy one of the following printers:

	Purchase price	Cost per page
Inkjet printer	\$500	\$0.40
Laser printer	\$4,000	\$0.20

- (a) She will print 20,000 pages. Which printer is more economical to purchase? Show your calculations.

(3 marks)

- (b) (i) She has designed a poster of size 2m×4m. Can she print it at home? Why?

- (ii) Suggest another type of printer for Mary to print the poster.

(3 marks)

- (c) Give **two** technical reasons why a thermal printer is commonly used instead of laser printer in point-of-sale (POS) terminals.

(2 marks)

5. John helps a clinic to modernise 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.

(ii) John finds that a 1-minute video takes up approximately 10MB. If the internal memory storage of the web camera is 64GB, calculate the maximum length of video that can be stored. Show your calculations.

(iii) 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.

(5 marks)

(b) 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.

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

(3 marks)

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

END OF PAPER