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

Date: 6 <sup>th</sup> January 2021	Name:	
Time: 10:30 a.m 12:00 nn	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. When a digital photo is printed on photo paper, the top and bottom parts of the photo paper are unused. What is/are the possible reason(s) for this?
  - (1) The aspect ratios of the digital photo and the photo paper are not the same.
  - (2) The file size of the digital photo is too large.
  - (3) The colour depth of the digital photo is too low.
  - A. (1) only
  - B. (2) only
  - C. (1) and (3) only
  - D. (2) and (3) only
- 2. What changes have been brought about by the emergence of the Information Age?
  - (1) More office space is needed.
  - (2) New ICT-related jobs appear and change the job market.
  - (3) There are more opportunities to acquire information and to learn new things.
  - A. (1) and (2) only
  - B. (1) and (3) only
  - C. (2) and (3) only
  - D. (1), (2) and (3)
- 3. Which of the following descriptions of smart home technology is **not** correct?
  - A. The technology is helpful for the elderly and disabled in daily life.
  - B. Home appliances can be controlled via a phone.
  - C. The technology can be applied to home security.
  - D. A web server must be installed at home.
- 4. A large company establishes a free online map of Hong Kong. Which of the following information is **least likely** to be included in the result of a location search?
  - A. Real-time video streaming
  - B. Satellite image
  - C. Name of the road
  - D. Information of schools nearby
- 5. An 8-bit code 10010011 is received without an error. The last bit is a parity bit. Using the same parity check, which of the following received codes has an error?
  - A. 00111111
  - B. 10000010
  - C. 10011011
  - D. 00110101

- 6. Which of the following statements about a check digit for a data item is correct?
  - The data item should not contain more than 8 characters. A.
  - The check digit cannot find all errors. B.
  - The check digit can correct errors. C.
  - The leading character of the data item should be a letter. D.
- 7. A WAV file, which is a common audio file, consists of a header. Which of the following items is stored in the header?
  - Compression ratio A.
  - Type of instrument used B.
  - Sampling rate C.
  - D. Type of audio player supported
- 8. An image file of the passage, P, is converted into a text file, Q, using Optical Character Recognition (OCR) software. Which of the following is correct?
  - The file size of Q is larger than that of P. A.
  - It is easier to edit the content of Q than that of P. B.
  - C. The texts in P and Q are the same.
  - The font styles used in P and Q are the same. D.
- 9. What type of data validation methods is commonly used for entering bar code information?



- A. Check digit
- B. Double entry
- C. Range check
- D. Format check
- 10. A black-and-white display board uses 8×8 pixels to illustrate a pattern. The upper left 4 pixels must be black at any time. How many different patterns can the display board illustrate?



- 60 A. B. 120  $2^{36}$
- C.
- $2^{60}$ D.

- 11. A colour photo is scanned using a scanner with 24-bit colours instead of 8-bit colours. This means that, in the chosen scanner,
  - (1) the resolution is higher.
  - (2) the file size is larger.
  - (3) more different colours can be scanned.
  - A. (1) and (2) only
  - B. (1) and (3) only
  - C. (2) and (3) only
  - D. (1), (2) and (3)
- 12. A company used a spreadsheet to handle customer information, but recently it has adopted a database system. Why?
  - A. Spreadsheets cannot validate input data.
  - B. Spreadsheets do not have a multiple-field sorting function.
  - C. Spreadsheets do not have a mail merge function.
  - D. Spreadsheets perform poorly when storing a large amount of data.
- 13. Peter creates a school newsletter and posts it on a web page. The newsletter is in portable document format (PDF) instead of word document format because
  - (1) hyperlinks can be included.
  - (2) the newsletter will be displayed in the same way on any device.
  - (3) the resolution of images in the newsletter will be higher.
  - A. (1) only
  - B. (2) only
  - C. (1) and (3) only
  - D. (2) and (3) only
- 14. Peter uses a word processor to produce the rundown of a music performance, as shown below:

Name	Instrument	Time	
Yvonne	Piano	2:00 pm	
Alan	Violin	2:20 pm	
Nelson	Flute	2:40 pm	

Which of the following can help Peter produce the rundown?

- (1) Set tab stops
- (2) Set columns
- (3) Insert a table
- A. (1) and (2) only
- B. (1) and (3) only
- C. (2) and (3) only
- D. (1), (2) and (3)

	А	В
1	Project	Day
2	Х	15
3	Х	20
4	Р	30
5	Х	10
6	Р	10
7	Х	5

15. Consider the spreadsheet below.

What is the output value of the following formula?

```
=SUMIF(A2:A7, "X", B2:B7)
```

- A. 50
- B. 70
- C. 80
- D. 90
- 16. In a spreadsheet, 5-digit membership numbers for a sports club, 00001, 00002, ..., 99999, are entered in some cells. Which of the following cell formats should be used?
  - A. Text format
  - B. General format
  - C. Number format
  - D. Scientific notation format
- 17. Peter uses a word processor to write a report. How can he decrease the total number of pages in the report?
  - (1) Decrease the line spacing
  - (2) Decrease the number of words on each line
  - (3) Decrease the margins
  - (4) Increase the character spacing
  - A. (1) and (3) only
  - B. (2) and (4) only
  - C. (1), (2) and (3) only
  - D. (2), (3) and (4) only

- 18. An electronic spreadsheet stores the dates of birth of players in a soccer team. Which of the following is/are a summary figure?
  - (1) The youngest member
  - (2) The number of members
  - (3) The average age of the team
  - (4) The age of each member
  - A. (4) only
  - B. (1) and (4) only
  - C. (2) and (3) only
  - D. (1), (2) and (3) only
- 19. In the following spreadsheet, which of the following formulas should be used in D4?

	A	В	С	D
1	Subject	Test 1	Test 2	Improvement
2	Chinese	80	80	0
3	English	75	80	5
4	Mathematics	75	80	5

- А. =С2-В2
- B. =C4-B4
- C. =D2-(D3+D4)

1 2

- D. =MAX(D2:D4)+MIN(D2:D4)
- 20. What formatting feature is used in the spreadsheet below?

Before:

	A			В	C
Ι	am	а	su	perman	

		А	В	С
After:	1	I am a superman		
	2			

- A. Wrap text
- B. Row height
- C. Merge cells
- D. Shrink text to fit

# **Section B – Structured Questions (60 marks)**

- 1. A food enterprise is planning to open a new chain of convenience shops in Hong Kong. The enterprise is going to hire some IT specialists for the development of a POS system for the convenience shops.
  - (a) Which type of IT specialist should be hired first? State **two** reasons to support your answer.

(3 marks)

After an IT specialist stated in part (a) is hired, he starts to follow the system development life cycle for the project.

- (b) (i) Data collection will be performed first. State **three** methods to collect relevant data.
  - (ii) What kind of software should be used to store the data collected?
  - (iii) Which type of IT personnel can be hired to facilitate development of the system?

(5 marks)

- (c) The data collected will then be used in the analysis process.
  - (i) State one type of software that can be used to analyze the data.
  - (ii) State one type of software that can be used to create the analysis report of the data.

2. Fukien Secondary School stores the data of students in a database table named 'STUDENT' with the following data structure:

Field	Field name	Туре	Field length	Description
1	NAME	Text	50	Student's name
2	ADDRESS	Text	50	Student's address
3	DOB	Date	8	Student's date of birth
4	SEX	Text	4	Student's sex

(a) (i) State **two** sources of errors that may happen during data entry.

(ii) Suggest one data validation method for the 'NAME' and 'SEX' fields respectively. Explain your answer briefly.

'NAME':	
'SEX':	
	(6 marks

(b) Which kind of data verification measure should be used to check whether the user has entered correct information before leaving the registration page of the system? Describe the measure briefly.

(2 marks)

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

3. A computer controls a display consisting of  $200 \times 7$  pixels, as shown below:



A white pixel and a black pixel are represented by '0' and '1' respectively. Method 1 and Method 2 are methods that use bit patterns to represent pixels in the display.

#### Method 1

A bit pattern consists of 8 bits. The first 7 bits represent a row of pixels and the 8th bit is always 1. The following example shows how 11010011 represents a row of pixels:



(a) Complete the display below by drawing pixels to represent the following five bit patterns, in order.

11010011 10000011 10000011 01111101



## Method 2

Similar to Method 1, if the 8th bit of a bit pattern is 1, the first 7 bits represent a row of pixels. If the 8th bit of a bit pattern is 0, the first 7 bits represent the number of occurrences (in binary notation) of the row of pixels represented by the next bit pattern.



(b) (i) Complete the display below by drawing pixels to represented by the following four bit patterns in order.

11111111 00000110 11010011 1111111

1	2	3	4	5	6	7

(2 marks)

(ii) Write down the three bit patterns for representing the following display:



Bit patterns:

(iii) What is the maximum number of rows of pixels represented by two bit patterns?

(2 marks)

(c) The following display consists of alternate rows of black pixels and white pixels. Compare the memory sizes needed for the following display represented by Method 1 and Method 2 respectively. Explain briefly.



- 4. Susan has taken an uncompressed video for her Disneyland trip last week. She is going to share it on the Internet. However, the video is too large to be uploaded to the server through the Internet.
  - (a) (i) Suggest **two** ways to reduce the file size of the video.
    - (ii) What is the shortcoming of reducing the file size of the video?

(3 marks)

- (b) (i) After minimizing the file size, recommend one type of technology that can reduce the waiting time after the download has been started. Explain your answer briefly.
  - (ii) Give one disadvantage of using the technology mentioned in part (b) (i).
  - (iii) State two video formats that support the function mentioned in part (b)(i).

(5 marks)

After a few days, Susan wants to sing a song and record it using her computer.

(c) In case the available audio formats are WAV, MP3 and MIDI, which one is the most suitable for recording her song? Explain why the other two formats are **not** suitable.

(3 marks)

5. Andy is a teacher in Fantastic Secondary School. He exports the test marks of his students from the database to a spreadsheet file. Refer to Table 1 which contains the worksheet in the spreadsheet file and answer the following questions.

	Α	В	С
1	StudentID	Subject	Mark
2	20171104	English	78
3	20171109	Chinese	65
4	20171114	Math.	54
5	20171125	English	42
6	20171104	Chinese	88
7	20171109	English	71
8	20171114	Chinese	35
9	20171125	Chinese	95
10	20171104	Math.	41
11	20171109	Math.	75
12	20171114	English	51
13	20171125	Math.	82

- Table 1
- (a) Andy arranges the records in Table 1 in ascending order of 'StudentID' and then 'Subject' first. Later, Table 1 is rearranged in ascending order of 'Subject' and then 'StudentID'.

Write the first **two** records for each case:

(i) Arrange in ascending order of 'StudentID' first, and then 'Subject'

StudentID	Subject	Mark

(ii) Arrange in ascending order of 'Subject' first, and then 'StudentID'

StudentID	Subject	Mark

)

(b) Complete the formula below to find out the number of records that their 'StudentID' is '20171104'.

COUNTIF(\_\_\_\_\_, \_\_\_\_\_,

(2 marks)

After that, Andy reorganises the data into the following format:

	Α	В	С	D
1	StudentID	Chinese	English	Math.
2	20171104	88	78	41
3	20171109	65	71	75
4	20171114	35	51	54
5	20171125	95	42	82
6	Highest			
7	Lowest			
8	Mean			

(c) (i) Write a formula in cell B6 to find out the highest mark of Chinese.

(ii) Write a formula in cell C7 to find out the lowest mark of English.

(iii) Write a formula in cell D8 to find out the mean of Mathematics.

(3 marks)

(d) An error message "#VALUE!" appears when Andy enters a formula in the spreadsheet. Explain why it happens. Suggest a way to solve this problem.

	A	В	С
1	Profit target	50,000	
2	Date	Daily net profit	Remark
3	1-1-2020	30,500	0
4	2-1-2020	-10,200	0
5	3-1-2020	82,800	1
÷	÷	÷	:
42	9-2-2020	5,800	0

6. Mary produces a spreadsheet to summarise the daily net profit, as shown below:

- (a) (i) In Column C, the value '1' indicates that the daily net profit is higher than or equal to the profit target value in B1, and the value '0' indicates that it is lower. Mary enters a formula in C3 and then copies it into C4 to C42. Write down the formula in C3.
  - (ii) Mary wants to use a chart to illustrate the daily net profit. Suggest an appropriate chart Mary can use by giving the following information.

Set two chart properties: \_\_\_\_\_

(5 marks)

(b) Mary uses spreadsheet software to analyse the daily net profit of the shops. She stores the daily net profit for February 2020 in a spreadsheet, as shown below:

	A	В	С	D
1	Store	Store manager	Net profit	Date
2	Central	John Lee	4,500	1-2-2020
3	Wan Chai	Kit Chan	-1,200	1-2-2020
÷	÷	÷	÷	÷
291	Lai King	Joe Wong	-800	1-2-2020

Mary uses a pivot table to summarise the data in the spreadsheet and illustrate some summary information. Outline the pivot table with appropriate column and row headings.

(3 marks)

(c) Consider the following spreadsheet.

	A	В	С	D
1	Item	Description	Price	Qty
2	5D	Canon 5D Mark IV	31,480.00	10
3	6D	Canon 6D Mark II	12,080.00	15
4	60D	Canon EOS 60D	6,480.00	38
5	70D	Canon EOS 70D	5,142.00	20

What is the return value for the following formula?

(i) =VLOOKUP("60D", A2:D5, 3, FALSE)

(ii) =VLOOKUP("70D", A2:D5, 3)\* VLOOKUP("70D", A2:D5, 4)

(2 marks)

**END OF PAPER**