INFORMATION AND COMMUNICATION TECHNOLOGY
PAPER 1 (SECTION A)

8.30 am – 10.30 am

(2 hours for both Sections A and B)

INSTRUCTIONS

1. Read carefully the instructions on the Answer Sheet. After the announcement of the start of the examination, you should first stick a barcode label and insert the information required in the spaces provided. No extra time will be given for sticking on the barcode label after the 'Time is up' announcement.

2. When told to open this book, you should check that all the questions are there. Look for the words **'END OF PAPER'** after the last question.

3. All questions carry equal marks.

4. **ANSWER ALL QUESTIONS**. You are advised to use an HB pencil to mark all the answers on the Answer Sheet, so that wrong marks can be completely erased with a clean rubber. You must mark the answers clearly; otherwise you will lose marks if the answers cannot be captured.

5. You should mark only **ONE** answer for each question. If you mark more than one answer, you will receive **NO MARKS** for that question.

6. No marks will be deducted for wrong answers.

Not to be taken away before the
end of the examination session

There are 40 questions in this paper.   Choose the most suitable answers.

1. Which of the following activities involve(s) the conversion of analog to digital data or vice versa?

    (1) Talking to a friend on a mobile phone
    (2) Listening to a radio programme over the Internet
    (3) Copying a file from a DVD-R to a hard disk

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

2. A computer system uses the Hong Kong identity card (HKID) number as a key field for managing accounts. Its check digit is used to detect input errors made by users. Which of the following input errors can usually be found by the check digit?

    (1) Use another person's HKID number.
    (2) Swap two digits in the HKID number.
    (3) Input a wrong digit in the HKID number.

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

3. Increment the following numbers using 8-bit two's complement representation by 1. Which one will create an overflow error?

    A. 01111111
    B. 10000000
    C. 10000001
    D. 11111111

4. In a computer system, 10 bits are reserved for user identity codes and 54 bits are reserved for alias names. What is the maximum number of user accounts in the system?

    A. 64
    B. 1024
    C. 10^{10}
    D. 10^{54}

5. 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
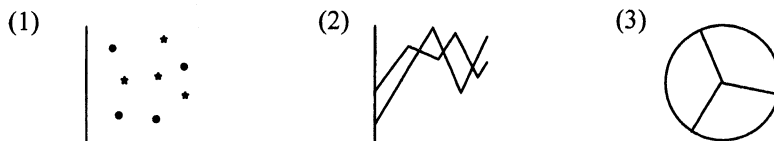   C. Presentation software
    D. Database software

6. In the following spreadsheet, the formula, '=SUM(A1:C3)', is entered in E1. What value is displayed in F2 after the formula in E1 is copied into F2?

	A	B	C	D	E	F
1	5	3	1		28	
2	5	2	5			
3	2	4	1			
4						

A. 12
B. 16
C. 19
D. 28

7. Mr Wong wants to create a chart to display the following nutritional data.

	A	B
1	Nutrition	Composition (weight)
2	Fat	20%
3	Cholesterol	5%
4	Sodium	5%
5	Carbohydrate	50%
6	Protein	20%

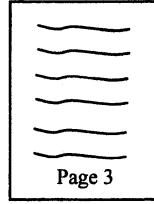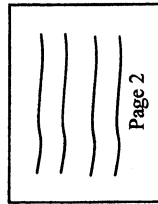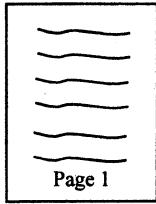Which type(s) of chart(s) is/are appropriate?

(1)   (2)   (3)

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

8. Only one record is retrieved after executing the following SQL command. Why?

```
SELECT NAME, PHONE FROM EMPLOYEE
```

(1) There is only one record in EMPLOYEE.
(2) The content of NAME or PHONE in the remaining records is empty.
(3) There may be some other fields in EMPLOYEE.

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

9.   Jenny prints a document. The first three pages are shown below:

Which formatting features of a word processor has she used?

A.   Table and footer
B.   Column and footer
C.   Margin and page orientation
D.   Section break and page orientation

10. John uses his notebook computer to create a web-based presentation through a web site. He does not use the pre-installed presentation software to do so. Why?

    (1) He can add more slides in the presentation.
    (2) He can edit the presentation in other computers without presentation software.
    (3) He can add video clips in the presentation.

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

11. When creating a database table, what should be defined?

    (1) Data type
    (2) Field name
    (3) Number of records

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

12. Which of the following is/are the best practice when using online banking systems?

    (1) Create an uncommon login name.
    (2) Use a combination of letters and numbers for the passwords and change them regularly.
    (3) Avoid using wired network when wireless network is available.

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

13. In 2012, the US Government launched a project to explore how 'big data' could be used. 'Big data' refers to the huge amount of data collected which is difficult to process using database management systems. Which of the following are examples of 'big data'?

    (1) Human DNA
    (2) User behaviour in a social networking web site
    (3) The total number of government officials in the US

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

14. The following QR code is printed on an advertisement so that readers can scan the code and browse product information online through smart phones. What information is encoded in the QR code?

  A. URL
  B. Telephone number of the company
  C. Type of smart phone supported
  D. Name of the product in binary codes

15. A WAV file, which is a common audio file, consists of a header. Which of the following items is stored in the header?

  A. Compression ratio
  B. Type of instrument used
  C. Sampling rate
  D. Type of audio player supported

16. Mary converts the file *animal.bmp* to *animal.jpg*. Why?
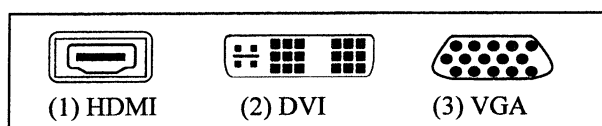
    (1) She wants to create a web page with this image.
    (2) She wants to store the image in DVD-R.
    (3) She wants to increase the resolution of the image.

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

17. A quad-core processor is generally better than a dual-core processor because

  A. more main memory is provided.
  B. the motherboard can be smaller.
  C. more instructions can be executed at the same time.
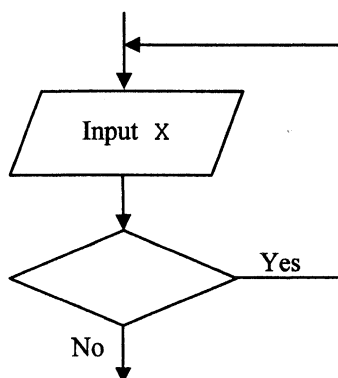 D. a graphics processing unit (GPU) can be installed.

18.   Mary connects a new USB flash drive to a computer. She does not need to install a driver program for the flash drive. Why not?

    A.   A USB flash drive does not require a driver program.
    B.   The flash drive uses the same driver program as the hard disk.
    C.   The computer does not connect to the Internet.
    D.   The operating system in the computer has the driver program for the flash drive already.

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?

(1) HDMI   (2) DVI   (3) VGA

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

20.   A car is equipped with a global positioning system (GPS) such that the driver can get the location and time information when driving. Which of the following best describes the mode of operation of the system?

    A.   Batch processing
    B.   Real-time processing
    C.   Distributed processing
    D.   Interactive processing

21.   Which of the following classifications is correct?

	Computer hardware	System software
A.	Modem	PDF writer
B.	Touch screen	RAM
C.	Word processor	Spreadsheet
D.	ROM	Utility program

22.   Joseph installs network-attached storage (NAS) in the office network that operates as a file server. If he installs more cache memory in the NAS, which of the following can be greatly improved?

    A.   Storage capacity
    B.   Flexibility of users' access rights
    C.   Network bandwidth
    D.   Data throughput

23. When browsing a web page, which of the following will be involved?

    (1) IP
    (2) URL
    (3) FTP

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

24. In an email application, the settings of __X__ and __Y__ are used for receiving email and sending email respectively.

	X	Y
A.	IMAP	POP
B.	IMAP	SMTP
C.	SMTP	IMAP
D.	SMTP	POP

25. Mary has a wireless network with Internet access at home. She finds that the file transfer rate between a notebook computer and a desktop computer through the network is very low. What is the possible reason for this?

    A. No wireless router is installed.
    B. The Internet connection is disconnected.
    C. The communication protocols used by the two computers are different.
    D. There is a thick wall between the computers and the wireless router.

26. A proxy server in a school network can _____.

    (1) increase the bandwidth of the Internet connection
    (2) filter web sites
    (3) store web pages for caching

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

27. What is/are the advantage(s) of using tablet computers in e-learning?

    (1) Students can easily carry tablet computers and access a Wi-Fi network.
    (2) Tablet computers can store a large amount of learning materials so that online resources will not be necessary.
    (3) Tablet computers have a high processing power.

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

28. Peter can use the following two methods to download files. He chooses Method 1. Why?

Method 1: Direct download through HTTP
Method 2: Download using Peer-to-Peer (P2P) file sharing technology

A. HTTP is a secure channel.
B. No dedicated software is required.
C. The data transfer rate is higher.
D. It is illegal to use Method 2.

29. When constructing tables in a web page, which of the following attributes of the tables can be set?

(1) Page margin
(2) Border
(3) Text alignment

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

30. The sales department of an insurance company wants to improve service to its clients. It asks the IT project manager to establish some web pages for the clients. What should the IT project manager do first?

A. Define the scope of the service.
B. Evaluate the IT equipment needed.
C. Estimate the project completion date.
D. Set up a project team and recruit programmers.

31. Part of a flowchart is shown below. The algorithm requests the user to repeatedly enter a number until a positive number is entered.

What should be filled in the decision box?

A. X > 0
B. X ≥ 0
C. X < 0
D. X ≤ 0

32. What is the output of the following algorithm?

```
X ← 5
Y ← 9
If (X+Y < 15)  or  (X-Y < X+Y)
    then  Y ← Y-X
    else  X ← Y-X
Output X, Y
```

A. 4   4
B. 4   9
C. 5   4
D. 5   9

33. What is the output of the following algorithm?

```
S ← 5
C ← 0
While S ≤ 10
    C ← C + 1
    S ← S + C
Output C
```

A. 11
B. 5
C. 4
D. 3

34. Which of the following public policies can improve the digital divide in Hong Kong?

(1) Subsidise low-income families so that they can get Internet access at home.
(2) Provide computer equipment to students in need.
(3) Give free training courses to citizens who lack basic IT skills.

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

35. Mary is a teenager and makes a new friend, Ada, through a random search function in a social networking web site. Ada wants to meet Mary the following Monday night at 10 p.m. in a restaurant. Mary's eldest brother advises her not to meet Ada. What is the major reason?

A. Mary can use another function in the social networking web site to make new friends.
B. Mary's eldest brother cannot join the meeting.
C. Ada's identity is not confirmed.
D. Mary can meet another friend earlier.

36.   John does not download patches to upgrade the operating system of his computer. Which of the following statements best describes the possible consequences?

A.   The license of the operating system will soon expire and he will have to re-install it.
B.   The operating system may be more vulnerable to attacks by hackers.
C.   The computer cannot connect to the Internet.
D.   The IP address of the computer may need to be changed.

37.   Which of the following can help visually impaired persons to browse the web?

(1)   Braille display device
(2)   Web filtering software
(3)   Screen magnification software

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

38.   Which of the following statements about copyright protection in Hong Kong is correct?

A.   Ideas are not protected unless they are in the form of expressions or products.
B.   The Customs and Excise Department cannot take legal action against copyright piracy unless the copyright owners file a complaint.
C.   A book cannot be protected unless it is published in Hong Kong.
D.   Computer programs are not protected unless the copyright owners inform the Office of the Government Chief Information Officer (OGCIO).

39.   Which of the following actions for desktop computers is/are environmentally-friendly?

(1)   Enable the power management function.
(2)   Lower the screen resolution.
(3)   Use LED monitors instead of CRT monitors.

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

40.   In an office network, a technician installs a firewall instead of antivirus software. What is the major reason for this?

A.   The computers in the office can be protected from adware.
B.   The network can be protected from online security threats.
C.   File transfer through the network can be faster.
D.   The network can withstand virus attacks.

END OF PAPER

Candidate Number

HONG KONG EXAMINATIONS AND ASSESSMENT AUTHORITY

HONG KONG DIPLOMA OF SECONDARY EDUCATION EXAMINATION 2014

INFORMATION AND COMMUNICATION TECHNOLOGY
PAPER 1 (SECTION B)
Question-Answer Book

8.30 am – 10.30 am
(2 hours for both Sections A and B)
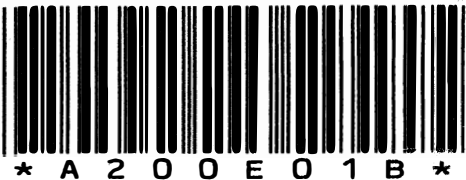This paper must be answered in English

INSTRUCTIONS

(1) After the announcement of the start of the examination, you should first write your Candidate Number in the space provided on Page 1 and stick barcode labels in the spaces provided on Pages 1, 3 and 5.

(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. Write your Candidate Number, mark the question number box and stick a barcode label on each sheet, and fasten them with string **INSIDE** this book.

(4) No extra time will be given to candidates for sticking on the barcode labels or filling in the question number boxes after the 'Time is up' announcement.

(5) The last page of this question-answer book contains a list of SQL commands and spreadsheet functions which you may find useful.

*A 2 0 0 E 0 1 B *

Answer all questions.

1. Ada develops a POS system for a restaurant. She designs the following screen output for waiters to use. There are two buttons, ⊕ and ⊖, beside each lunch set. They are used to select the quantities of the corresponding lunch sets.

```
┌─────────────────────────────────────────────────────────────┐
│                   ABC Dim Sum Restaurant                     │
│                                                               │
│    ┌──────────────┐               ┌──────────────┐           │
│    │ Lunch Set 1  │  ⊕  ⊖         │ Lunch Set 4  │  ⊕  ⊖    │
│    └──────────────┘               └──────────────┘           │
│    ┌──────────────┐               ┌──────────────┐           │
│    │ Lunch Set 2  │  ⊕  ⊖         │ Lunch Set 5  │  ⊕  ⊖    │
│    └──────────────┘               └──────────────┘           │
│    ┌──────────────┐               ┌──────────────┐           │
│    │ Lunch Set 3  │  ⊕  ⊖         │ Lunch Set 6  │  ⊕  ⊖    │
│    └──────────────┘               └──────────────┘           │
│                                                               │
│  P →  ┌─────────────────────────────────────────────┐        │
│       └─────────────────────────────────────────────┘        │
│                                                               │
│  Q →  ┌─────────────────────────────────────────────┐        │
│       └─────────────────────────────────────────────┘        │
│              ┌─────────┐   ┌─────────┐                        │
│              │ Confirm │   │ Cancel  │                        │
│              └─────────┘   └─────────┘                        │
└─────────────────────────────────────────────────────────────┘
```

(a) (i) In Area P, waiters will input some numerical data. Give **two** examples of these data.

_____

_____

_____

(ii) Ada should apply some appropriate validation checks to the input data. Describe **two** examples of the validation checks.

_____

_____

_____

(iii) In Area Q, waiters will receive some output data. Give **two** examples of these data.

_____

_____

_____

(6 marks)

(b) Ada is going to take photos of the lunch sets for the POS system. Give **two** attributes of the image files that affect the quality of these photos.

_____

_____

(2 marks)

In the POS system, the daily transactions are stored in a spreadsheet file. Ada can use spreadsheet software to generate daily summary reports for the management.

(c) (i) Suggest a spreadsheet function that Ada may use in the reports. Describe briefly.

_____

_____

(ii) Ada chooses to use database software instead. Give **two** benefits of her choice.

_____

_____

(3 marks)

2. A company has branch offices in different countries. The computer networks in the offices form a wide area network. Ms Wong regularly visits the offices. She will use a notebook computer to connect to the wide area network.

(a) Other than email, suggest **three** types of computer applications Ms Wong can use to transfer files.

_____

_____

_____

_____

(3 marks)

(b) In an international airport, Ms Wong can directly connect to the free Wi-Fi network. Ms Wong finds that the speed of the Internet connection is slow although the network signal is strong. Why?

_____

_____

_____

_____

(2 marks)

(c) When Ms Wong visits the branch office in Singapore, she needs to install a client program to connect to the Wi-Fi network in the office. Give **two** benefits of using this client program for this purpose.

_____

_____

_____

(2 marks)

(d) Ms Wong goes on a business trip to Vietnam. She needs to bring her notebook computer, tablet computer and smart phone to connect to the Internet through a data port on the wall of her hotel room. State the hardware she should have and describe the network connection briefly.

_____

_____

_____

(2 marks)

Ms Wong's colleague in Hong Kong, David, creates a simple web page for Ms Wong so that she can send files back to the server in Hong Kong when visiting branch offices.

(e) To construct the web page, David uses a text editor to write HTML code instead of using a web authoring tool. Give one benefit of each tool.

Text editor: _____

_____

Web authoring tool: _____

_____

(2 marks)

(f) Ms Wong sends David a data file using the Public Key Infrastructure (PKI) technology.

(i) What is the benefit of having the PKI?

_____

_____

(ii) Briefly describe a way that PKI is used to complete the file transfer.

_____

_____

_____

_____

(3 marks)

Provided by dse.life

3.　　The following algorithms ALG1 and ALG2 help George find a sequence of numbers.

ALG1	ALG2
``` A ← 0 B ← 1 P ← 10 While A <= P do Output A temp ← A + B A ← B B ← temp ```	``` A ← 0 B ← 1 Q ← 5 For I from 1 to Q Output A temp ← A + B A ← B B ← temp ```

(a)　(i)　Write down the output values of ALG1.

_____

　　(ii)　Write down the output values of ALG2.

_____

　　(iii)　If the output values of ALG2 need to be the same as those of ALG1, what should the initial value of Q be changed to?

_____

(5 marks)

George further develops the algorithms to build an Internet application.

(b)　(i)　If the application is a parallel processing system, how does the application work?

_____

_____

_____

　　(ii)　If the application is a distributed processing system, how does the application work?

_____

_____

_____

(4 marks)

(c) George can use either freeware or open source software to develop the application.

(i) What is the major common characteristic of the two types of the software?

_____

_____

(ii) What is the major difference in terms of the resources that the software provides?

_____

_____

(iii) Why do some people promote open source software instead of freeware?

_____

_____

_____

(4 marks)

4. Mr Chan develops a computer system in a school. He creates a table, STUDENT, to store student information. The first five fields of STUDENT are listed below:

STUDENT

Field name	Description
USERNAME	English name of the student
LOGINID	Login identity code of the student
PASSWORD	Login password of the student
CLASS	Class of the student
CLASSNO	Class number of the student

(a) (i) Mr Chan does not use Hong Kong identity card numbers as LOGINID. Why not? Explain briefly.

_____

_____

(ii) Mr Chan uses email addresses as LOGINID. Why? Explain briefly.

_____

_____

(iii) Mr Chan should not use CLASS and CLASSNO as a composite key field to identify records. Why not? Explain briefly.

_____

_____

(3 marks)

(b) Suppose that there are four records in STUDENT, as shown below.

USERNAME	LOGINID	PASSWORD	CLASS	CLASSNO
Cheng Ching Yee	cycheng@sch.edu.hk	ChengCY	1C	3
Wong Pak Ting	ptwong@sch.edu.hk	polygon	1B	30
Ho King Wan	kwho@sch.edu.hk	3HgQ7@e	1A	12
Fan Hoi Kan	hkfan@sch.edu.hk	9548627	1B	8

(i) Mr Chan executes the following SQL command. What is the output?

SELECT CLASS, USERNAME FROM STUDENT ORDER BY CLASS

(ii) Of the passwords in the four records, which one is the most secure?

_____

(iii) Suggest **two** principles for designing a good password.

_____

_____

_____

(5 marks)

(c) Mr Chan exports data from some fields in STUDENT into a spreadsheet file. Unauthorised persons might be able to access the file. How can Mr Chan protect the data? Give **two** methods.

_____

_____

_____

(2 marks)

(d) (i) Mr Chan wants to add an extra field CNAME to STUDENT to store students' Chinese names. Which code, Unicode, GB code or Big-5 code, should he use? Justify your answer.

_____

_____

(ii) Mr Chan uses a word processor to print some letters to be sent to students to inform them about their login information and asking them to activate their accounts. Suggest an efficient way for him to do this.

_____

_____

(2 marks)

5. 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)

END OF PAPER

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

Constants	FALSE, TRUE
Operators	+, –, *, /, >, <, =, >=, <=, <>, %, _ , ' , AND, NOT, OR
SQL	ABSOLUTE (ABS), AVG, INT, MAX, MIN, SUM, COUNT ASC, AT, CHAR (CHR), CHAR_LENGTH (LEN), LOWER, TRIM, SPACE, SUBSTRING (SUBSTR/MID), UPPER, VALUE (VAL) DATE, DAY, MONTH, YEAR ADD, ALL, ALTER, ANY, AS, ASC, BETWEEN, BY, CREATE, DELETE, DESC, DISTINCT, DROP, EXISTS, FROM, GROUP, HAVING, IN, INDEX, INNER JOIN, INSERT, INTEGER, INTERSECT, INTO, LEFT [OUTER] JOIN, LIKE, MINUS, NULL, RIGHT [OUTER] JOIN, FULL [OUTER] JOIN, ON, ORDER, SELECT, SET, TABLE, TO, UNION, UNIQUE, UPDATE, VALUES, VIEW, WHERE

Electronic Spreadsheet

Constants	TRUE, FALSE
Operators	+, –, *, /, <, >, =, <>, <=, >=
Functions	ABS, INT, MOD, QUOTIENT, RAND, ROUND, ROUNDUP, ROUNDDOWN, SQRT, TRUNC, AND, NOT, OR CHAR, CODE, CONCATENATE, EXACT, ISBLANK, LEFT, LEN, LOWER, MID, PROPER, RIGHT, TEXT, TRIM, UPPER, VALUE AVERAGE, COUNT, COUNTA, COUNTBLANK, COUNTIF, LARGE, MAX, MIN, RANK, SMALL, SUM, SUMIF, SUMPRODUCT, SUMSQ, FREQUENCY DATE, NOW FIND, HLOOKUP, VLOOKUP, LOOKUP, SEARCH, CHOOSE IF