FUKIEN SECONDARY SCHOOL S4 First Term Uniform Test (2021-2022) Information and Communication Technology (1 hour)

Date: 11th November 2021 Time: 10:30a.m. – 11:30a.m.

Name:_____ 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 88.
- 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. Peter would like to buy a new tablet computer in an online shop. He fills out and submits an online purchase order through a web site of the online shop. Which stage of the Input-Process-Output cycle does his action correspond to?
 - A. Input
 - B. Process
 - C. Output
 - D. None of the above

2. Which of the following items contain(s) stored programs?

- (1) A drone
- (2) A robot car
- (3) An electric kettle
- A. (1) only
- B. (2) only
- C. (1) and (2) only
- D. (1), (2) and (3)
- 3. Which of the following character coding systems **cannot** store Chinese characters?
 - A. Unicode
 - B. ASCII
 - C. Big5
 - D. UTF-8

4. Which of the following mappings is **incorrect**?

	Date type	Possible input device / software
А.	Text	Voice recognition system
B.	Image	A scanner
C.	Audio	A set of speakers
D.	Video	A web cam

- 5. Paul is responsible for setting up the Wi-Fi connection and monitoring the performance of the communication between the computer systems in his company. What is his role in the personnel component of the information system?
 - A. Technician
 - B. Network manager
 - C. Systems analyst
 - D. Programmer
- 6. Which of the following is **not** an appropriate description of the knowledge-based society in the information age?
 - A. Citizens have access to communication networks of a low transmission speed and high cost.
 - B. Citizens are generally information literate.
 - C. Citizens have easy access to computers.
 - D. Citizens can retrieve up-to-date information anywhere and anytime.

- 7. Which of the following is **not** an information process of the information life cycle?
 - A. Data orientation
 - B. Processing
 - C. Transmission
 - D. Presentation
- 8. Which of the following statements about the primary key of a database table is/are correct?
 - (1) The data in the primary key field(s) must be unique among all the records in the table.
 - (2) The data in the primary key field(s) must not be blank.
 - (3) The data type of the primary key field(s) must be number.
 - A. (1) only
 - B. (3) only
 - C. (1) and (2) only
 - D. (1) and (3) only
- 9. Parity check is going to be employed in a binary number '10001110'. What will the number become after an even parity bit is added?
 - A. 100011101
 - B. 100011100
 - C. 110001110
 - D. 010001110
- 10. Which of the following is the smallest unit of data which can be accessed by a user in a database?
 - A. Field
 - B. Form
 - C. Record
 - D. Table
- 11. Which of the following is/are the function(s) of DBMS?
 - (1) Report
 - (2) Data entry form
 - (3) Query form
 - A. (1) only
 - B. (2) only
 - C. (2) and (3) only
 - D. (1), (2) and (3)
- 12. Paul is the manager of a cinema. He has created a table named movie which contains the information of a number of movies. One of the fields is titled fee which stores the ticket fee of the corresponding movie in integer format. Which of the following SQL commands can delete all records with ticket fees more than 70?
 - A. DELETE FROM TABLE movie WHERE fee > 70
 - B. DELETE FROM TABLE movie WHERE fee \geq 70
 - C. USE movie DELETE fee > 70
 - D. USE movie DELETE fee >= 70

- 13. Which of the following SQL commands can delete the field date from the table product?
 - A. DELETE date FROM TABLE product
 - B. UPDATE TABLE product DROP date
 - C. ALTER TABLE product DROP date
 - D. INSERT TABLE product DELETE date
- 14. John is registering for a new e-mail account. Due to security issues, the new password entered by John is hidden from the registration form after inputting. Which of the following methods can verify that John has input the correct choice of new password when filling in the form?
 - A. Double data entry
 - B. Field presence check
 - C. Input data twice
 - D. Type check
- 15. Which of the following descriptions is/are correct?
 - (1) There are three types of file access modes, namely sequential access, direct access and DBMS.
 - (2) A report provides users with an interface for extracting and displaying records.
 - (3) One index file only refers to one instance of a specific table.
 - A. (1) only
 - B. (2) only
 - C. (3) only
 - D. (1), (2) and (3)
- 16. A check digit, '1', is appended to the end of the binary number '10011010'. Which of the following types of check digit is used?
 - A. Even parity check
 - B. Odd parity check
 - C. Modulo-7
 - D. Modulo-11
- 17. Which of the following numbers is/are larger than 120_{10} ?
 - (1) 100000_2
 - (2) 1111000_2
 - (3) 80₁₆
 - A. (1) only
 - B. (3) only
 - C. (1) and (3) only
 - D. (1), (2) and (3)
- 18. What is the two's complement representation of -48_{10} ?
 - A. 11010000₂
 - B. 00110000₂
 - C. 00111000₂
 - D. 10111111₂

- 19. What is the signed 8-bit binary representation of a number 11100111 represented by two's complement?
 - A. 10011111₂
 - B. 10011001₂
 - C. 11100111₂
 - D. 11100110₂

20. The ASCII codes for the characters 'X' and 'Z' in hexadecimal are ______ and 5A respectively.

- A. 3A
- B. 3C
- C. 58
- D. 59

Section B – Structured Questions (48 marks)

1. John is a teacher. He is handling the results of the final exam of his class 1A. The data of the first four students is stored in the table below.

Class	Class No.	Name	Phone No.	Mark	Grade
1A	1	Chan Tai Ming	98765432	51	С
1A	2	Chan Yuen Yei	23456789	63	С
1A	3	Cheung Mei Mei	32456789	72	В
1A	4	Hui Sui Ming	39876543	97	А

(a) (i) Describe **two** improvements which can be made to the design of the table.

(2 marks)

(ii) Describe three areas John should perform for manual validity check.

(3 marks)

(iii) Describe how John can find the students who achieve(s) the highest mark.

(1 mark)

(b) John would like to store the data. Give **three** examples of storage media that John can use.

(3 marks)

(c) By making this table, John claims that he is information literate. Do you agree? Why?

(3 marks)

2. John is the manager of a company. He is creating a web site for staff to check notifications and e-mails from the company. Each staff has his individual account. The staff data, including usernames and passwords, are stored in a database, which is accessed every time an employee is logging onto the account.

John would like to assign an employee ID number to each staff, which acts as the username for logging into the account. The ID number contains 4 digits and one check digit. The sum of every digit multiplied by its corresponding weight should be divisible by 10. The following shows an example of ID number of 54273.

Example	5	4	2	7	3
Weight	12	9	5	3	1
Value × weight	60	36	10	21	3

60 + 36 + 10 + 21 + 3 = 130, which is divisible by 10.

(a) Describe what a check digit is, and explain how it can lessen the frequency of database access in John's situation.

(4 marks)

(b) (i) State the value of the check digit if an employee ID starts with '6328'.

(1 mark)

(ii) Is the employee ID '73429' valid? Explain why.

(2 marks)

John would like to create a table for storing the staff data.

(c) (i) In addition to the employee ID and password (a piece of text with 10 characters), suggest three appropriate fields of data John should collect and store, together with their field type.

(3 marks)

 Write down the SQL command for creating such a table with the fields you have suggested in part (c)(i).

(2 marks)

- 3. Peter creates a table in a database using the following SQL command: CREATE TABLE products (product_name char(150), quantity integer, price decimal(5, 1), provider_name char(150))
 - (a) (i) Write down the fields and the corresponding field types and lengths for the above table.

(4 marks)

(ii) Describe a possible situation for using such a database table.

(1 mark)

(b) (i) Peter would like to insert a new record for the product 'Apple' made by the provider 'Apple Farm'. There are 30 such items, and the price for each of them is 10 dollars. Write down the SQL command for inserting this record.

(2 marks)

(ii) Peter finds that he has made a mistake in counting the number of items received. Instead of 30, the number should be 20. Write down the SQL command for modifying the record in the database.

(2 marks)

(iii) Describe a problem Peter may encounter while executing the SQL command designed in part (b)(ii) and suggest the corresponding solution.

(2 marks)

(c) Peter would like to create an interface to input record easily. State a function of DBMS that can help Peter.

(1 mark)

- 4. Xiao Ling, a PRC citizen, uses a simplified Chinese operating system. One of her Hong Kong friends has sent a Chinese document to her through e-mail. She finds that the document is not readable.
 - (a) State one possible cause of the problem.

Later, she browses a web page of a Hong Kong company. She finds that the Chinese characters displayed are unrecognizable.

- (b) (i) State one possible cause of the problem.
 - (ii) How can the problem be solved?

(4 marks)

(2 marks)

Inside a computer system, negative binary numbers are stored in either sign and magnitude or two's complement approaches. Assume that an 8-bit memory unit is used.

(c) (i) What is the range of numbers that can be represented by sign and magnitude?

(ii) What is the range of numbers that can be represented by two's complement?

(iii) Why are the ranges mentioned in part (c) (i) and part (c) (ii) different?

(6 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