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INFORMATION AND COMMUNICATION TECHNOLOGY

0417/13

Paper 1 Theory

October/November 2023

1 hour 30 minutes

You must answer on the question paper.

No additional materials are needed.

INSTRUCTIONS

- Answer **all** questions.
- Use a black or dark blue pen.
- Write your name, centre number and candidate number in the boxes at the top of the page.
- Write your answer to each question in the space provided.
- Do **not** use an erasable pen or correction fluid.
- Do **not** write on any bar codes.
- You may use an HB pencil for any diagrams, graphs or rough working.

INFORMATION

- The total mark for this paper is 80.
- The number of marks for each question or part question is shown in brackets [].
- No marks will be awarded for using brand names of software packages or hardware.

This document has **12** pages. Any blank pages are indicated.

Chapter 7 - SDLC - Design Phase

- 1 Peter needs to create a validation check for product numbers. Three examples of product numbers he needs to check are:

977135120127916

976143148163921

845132120651166

Identify **two** validation checks he could use to check the numbers.

- 1 Check digit
- 2 Type check

[2]

- 2 A student has created a document with images for her geography project.

- (a) The layout of page one is portrait orientation. The student needs to set page two as landscape orientation. Before she can set the landscape orientation she needs to insert a break.

State the type of break that is needed.

..... Section break [1]

- (b) The student has placed images in the document. chapter 11 - file management

State **two** file formats she could have used for the images.

- 1jpg/.jpeg
- 2png

[2]

- (c) Each page of the document includes a footer.

Explain why a footer is used.

- Information is repeated on each page
- Save time for the student to add information manually
- Information only needs to be entered once

[3]

Chapter 13
Layout

- 3 A teacher is setting up a school shop. The teacher is setting up a spreadsheet to keep the accounts of the shop.

- (a) Fig. 3.1 shows a box containing 50 Choco Bars to sell in the shop. The information on the box will be entered into the spreadsheet.

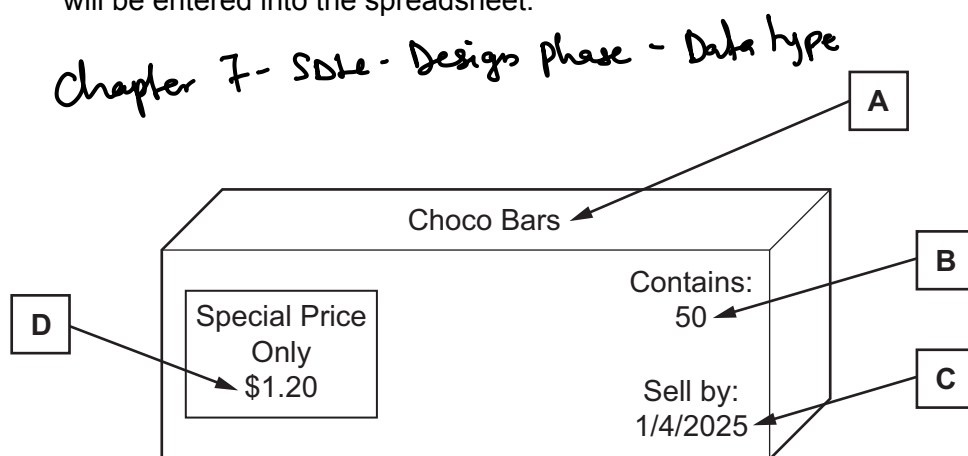


Fig. 3.1

State the most appropriate display format in the spreadsheet for each piece of data shown on the box. Your answer must be different in each case.

- A Text
- B Numeric: Integer
- C Numeric: Date / Time
- D Numeric: Currency

QR- Quick response

[4]

- (b) Each box delivered to the school shop includes a QR code.

Explain why QR codes are used.

Chapter 2 - Input and output devices

- Can be read by any device with a camera and suitable software
- Can contain link to more information about the products
- It can contain information about the product
- The physical size of the QR Code can be small therefore taking up less space on the box

[4]

- (c) The teacher has created a formula in the spreadsheet that calculates the cost of purchasing a number of different items.

She has created a formula that:

- subtracts the discount per item from the price of the item to find the cost of the item
- then multiplies the cost of the item by the quantity.

	A	B	C	D	E	F
1	Product	Price of item	Discount per item	Quantity	Total	
2	Choco Bar	\$1.20	\$0.20	15	-\$1.80	

B - Bracket
O - order
D - Division
M - Multiplication
A - Addition
S - Subtraction

step 1 = $(B2 - C2) = 22$
The formula she enters into cell E2 is:

step 2 = $22 * D2 = (B2 - C2) * D2$
= step 1 = $(C2 * D2) = 22$
 $(B2 - 22)$

Chapter 20 - Spreadsheet
BODMAS

When this formula is entered into cell E2 the result is **not** what she expected. The result should be \$15.00

Explain why the result was **not** \$15.00

- Bracket / Parenthesis was missing around $B2 - C2$
- The multiplication was carried out first then the subtraction

Others

- The order of calculation should follow BODMAS

[2]

4 A company's computer system is protected by both a user ID and a password.

(a) Explain how a user ID and a password are used to increase the security of data.

- Passwords increase security as they are only known by the user
- A strong password is a combination of upper case, lower case, characters/symbols, number
- User ID give different access levels in the computer system
- If someone knew your user ID they could only gain access with the correct password
- User ID and Password combined protect against unauthorized access
- The user ID ensures the account is accessed, the password then ensures the account is protected

[6]

(b) The company plans to improve the security of its computer system by using biometric methods.

Describe what is meant by biometric methods. Give **two** examples of biometrics.

Description form of authentication

- it's unique to the user

Example 1 finger print

Example 2 voice

[4]

- 5 A student needs to purchase a new computer for use on his university course.

The laptop computers available to him are one that contains a solid-state drive (SSD) or one that only stores data on the internet, using the cloud.

Evaluate these two types of laptop computer.

Cloud Storage

- More Storage is available
- The information is available on other devices if the laptop becomes faulty
- It is expensive as storage needs to be bought
- Automatic backup of data, so less chance of losing data

Laptop with SSD

- The user retains control over the data stored
- Greater security, as the laptop is always with you
- After the initial payment of the laptop there is nothing to pay for (storage)

[6]

Chapter 6 - ICT applications - Modelling

- 6 A computer model can be used to design and test a bridge before it is built.

Discuss the benefits and drawbacks of using a computer model before building a bridge.

Benefits

- Cheaper than building a physical bridge
- Safer to check environmental factors
- Tests can be carried out with extreme weather conditions

- Safer as the bridge could collapse if not tested properly

Drawbacks

- Error in the software could be catastrophic
- Requires extra skilled staff to maintain the model

[6]

- 7 Rockit Aircraft manufactures and flies aeroplanes.

- (a) The pilots at Rockit Aircraft are trained using extended reality.

Describe what is meant by extended reality. Chapter 1 - Extended Reality

- Allow seamless interaction between the real and virtual worlds
- Mixture of virtual reality and augmented reality.

[2]

Chapter 2,

- (b) Some of the components used in the manufacture of aircraft are produced using a 3D printer.

Analyse the use of a 3D printer to make the components rather than making the components by hand.

- Quality is Consistent
- Minimise waste
- If the initial design is incorrect it is harder to correct
- Initial cost of the printer could be costly
- The whole process of setting up and printing the component can be quicker
- Requires skilled programmer which could be expensive

[6]

- 8 Many devices in the home can be connected to the internet so they can be controlled remotely. These devices are called smart devices. A house contains a smart security system.

- (a) Describe the benefits and drawbacks of using a smart security system.

Benefits

- Increase sense of security
- You receive immediate alerts if there is a security breach

Drawbacks

- If access to the internet is lost then control of the system is lost
- You may not be able to deal with intruders if you are far away.

[4]

Chapter 5

- (b) Identify **two** sensors that could be used with the smart security system.

1 Light
 2 Temperature

[2]

- (c) Part of the smart security system involves an automatic gate for vehicles approaching the house. There is a CCTV camera at the gate and the smart security system has software for recognising each vehicle's number plate.

Explain how automatic number plate recognition (ANPR) systems work. *Chapter 6.*

- The image is taken of the front of the vehicle
- The image is sent to the software
- The software isolates the number plate from the image
- Each character is read using OCR software
- The number plate is searched in the database
- If the number plate is identified, the gate is open for the vehicle.

[4]

- (d) Describe **three** problems that could occur when the ANPR system reads a vehicle number plate.

- The number plate has not been added to the system
- The number plate maybe too dirty to read
- The number plate may use illegal font

[3]

Chapter 2
Input & output
devices.

- 9 The secretary of Tawara University has created web pages for former students. The former students are adults.

(a) State the design features of the web pages that would meet the needs of this target audience.

Chapter 9
Audiences

1. Large fonts to help those with visual impairment
2. Clear font
3. Balancing of text and image
4. Keep the content simple
5. Interactive
6. Interesting content

[6]

(b) The web pages conform to the university's corporate house style.

Describe why a corporate house style is used.

Chapter 14
- styles

- provides consistency
- People using the web page must know it's part of the university website
- Allows all documentation to contain the same header information

[3]

(c) Give **four** design features of a corporate house style.

1. Corporate font style
2. Corporate font size
3. Corporate colours used
4. Inclusion of the logo

[4]

Chapter 7 - Sote - Analysis

10 A school has employed a systems analyst to help update its computerised examination system.

- (a) The systems analyst researches the current system to see what will be required in the new system.

State the methods of researching the current system that are described:

- (i) talking to the network manager and examinations officer about the current system

..... Interview [1]

- (ii) watching the users operating the current system

..... Observation [1]

- (iii) forms sent out to all users to complete and return.

..... Questionnaires [1]

- (b) After completing the analysis, the new system needs to be designed. One item that needs to be designed is a file structure.

Identify **three** other items that would need to be designed.

- 1 Data Structure
- 2 Input Format
- 3 Validation routine

[3]

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