Cambridge Assessment International Education

Cambridge IGCSE™

CANDIDATE NAME									
CENTRE NUMBER						CANDIDATE NUMBER				

9403522689

INFORMATION AND COMMUNICATION TECHNOLOGY **0417/12**

Paper 1 Theory **May/June 2024**

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 **16** pages. Any blank pages are indicated.

[Turn over

1 Circle **two** items of internal memory.

Actuator	Cloud	DVD	Memory stick
Printer	RAM	ROM	Sensor

[2]

2 Complete each of the following sentences which relate to health and safety issues when using ICT equipment.

(a) Trailing leads in a computer room can cause

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[1]

(b) Continual typing on a keyboard can cause

.....

[1]

(c) Staring at a computer screen for long periods of time can cause

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[1]

(d) Spilling water onto computer equipment can cause

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[1]

3 Remotely logging in to a college computer system requires two-factor authentication.

(a) Explain what is meant by two-factor authentication.

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[2]

(b) State **two** examples of methods that could be used as part of two-factor authentication.

Example 1 .....

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Example 2 .....

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[2]

4 Vehicles can contain microprocessor controlled devices to improve transport safety. For example when a vehicle approaches a road speed sign the microprocessor sends an alert to the driver.

Discuss the positive and negative effects of using microprocessor controlled devices in transport safety.

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[6]

5 One difference between a command line interface (CLI) and a graphical user interface (GUI) is that a GUI takes up more memory.

(a) State **two** other differences between a CLI and a GUI.

1 .....

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2 .....

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[2]

(b) State **two** other types of user interface.

1 .....

2 .....

[2]

6 **(a)** Explain what is meant by electronic conferencing.

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[2]

(b) State, giving a reason for your choice, the hardware required to set up an electronic conference.

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[4]

7 A college principal has decided that students can use mobile devices to take notes in lessons. Some students use laptop computers whilst others use smartphones.

(a) Describe the benefits and drawbacks of using laptop computers rather than smartphones for this purpose.

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[4]

(b) There are safety issues related to bringing laptop computers into the college. The Network Manager has decided to produce a paper-based certificate for students to prove that their laptop computer is safe to use.

Describe the main features that should be considered for the design of this certificate.

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[4]

8 **(a)** Explain the differences between virtual reality (VR) and augmented reality (AR).

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[2]

(b) Discuss the impact of augmented reality (AR) on everyday life.

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[6]

9 Explain the following components of an expert system.

(a) User interface

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[3]

(b) Knowledge base

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[3]

10 Cars can have sensors at the front and rear of the vehicle to detect obstacles.

Describe how the sensor detects an obstacle and sends the data to the microprocessor when parking the car.

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[4]

11 A company with many branches is implementing a new system. The manager is planning to implement the new system either by pilot changeover or parallel running.

(a) Contrast pilot changeover and parallel running.

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[5]

(b) When the system is implemented, technical documentation is produced.

State **three** components that would be included in the technical documentation.

1 .....

2 .....

3 .....

[3]

12 One of the risks when entering a password into a system is shoulder surfing.

(a) Explain what is meant by shoulder surfing.

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[2]

(b) Give **two** security improvements that could be made to reduce shoulder surfing.

1 .....

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2 .....

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[2]

13 When a person changes their password they are asked to verify that it has been entered correctly by re-entering the password.

(a) State what this type of verification is called.

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[1]

(b) The keyboard used to enter the password is an input device.

Explain the differences between input and output devices.

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[4]

(c) State the direct data entry device that is used to read the following types of data.

(i) 

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[1]

(ii)

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[1]

(iii)

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[1]

(iv)

.....

[1]

14 State **three** advantages of using solid state storage devices rather than magnetic storage devices.

1 .....

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2 .....

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3 .....

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[3]

15 Explain why data protection legislation is required.

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[4]

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INFORMATION AND COMMUNICATION TECHNOLOGY **0417/12**

Paper 1 Theory **May/June 2024**

MARK SCHEME

Maximum Mark: 80

Published

This mark scheme is published as an aid to teachers and candidates, to indicate the requirements of the examination. It shows the basis on which Examiners were instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners' meeting before marking began, which would have considered the acceptability of alternative answers.

Mark schemes should be read in conjunction with the question paper and the Principal Examiner Report for Teachers.

Cambridge International will not enter into discussions about these mark schemes.

Cambridge International is publishing the mark schemes for the May/June 2024 series for most Cambridge IGCSE, Cambridge International A and AS Level and Cambridge Pre-U components, and some Cambridge O Level components.

This document consists of **9** printed pages.

Generic Marking Principles

These general marking principles must be applied by all examiners when marking candidate answers. They should be applied alongside the specific content of the mark scheme or generic level descriptions for a question. Each question paper and mark scheme will also comply with these marking principles.

GENERIC MARKING PRINCIPLE 1:

Marks must be awarded in line with:

- the specific content of the mark scheme or the generic level descriptors for the question
- the specific skills defined in the mark scheme or in the generic level descriptors for the question
- the standard of response required by a candidate as exemplified by the standardisation scripts.

GENERIC MARKING PRINCIPLE 2:

Marks awarded are always **whole marks** (not half marks, or other fractions).

GENERIC MARKING PRINCIPLE 3:

Marks must be awarded **positively**:

- marks are awarded for correct/valid answers, as defined in the mark scheme. However, credit is given for valid answers which go beyond the scope of the syllabus and mark scheme, referring to your Team Leader as appropriate
- marks are awarded when candidates clearly demonstrate what they know and can do
- marks are not deducted for errors
- marks are not deducted for omissions
- answers should only be judged on the quality of spelling, punctuation and grammar when these features are specifically assessed by the question as indicated by the mark scheme. The meaning, however, should be unambiguous.

GENERIC MARKING PRINCIPLE 4:

Rules must be applied consistently, e.g. in situations where candidates have not followed instructions or in the application of generic level descriptors.

GENERIC MARKING PRINCIPLE 5:

Marks should be awarded using the full range of marks defined in the mark scheme for the question (however; the use of the full mark range may be limited according to the quality of the candidate responses seen).

GENERIC MARKING PRINCIPLE 6:

Marks awarded are based solely on the requirements as defined in the mark scheme. Marks should not be awarded with grade thresholds or grade descriptors in mind.

Mark scheme comments

/ separates alternative words / phrases within a marking point
// separates alternative answers within a marking point
underline actual word given must be used by candidate (grammatical variants accepted)
max indicates the maximum number of marks that can be awarded
( ) the word / phrase in brackets is not required, but sets the context
Note: No marks are awarded for using brand names of software packages or hardware.
Examiners must ensure that annotations are placed to show that the whole answer has been seen
Annotations MUST be placed in white space close to where the mark is awarded
Before submitting a script please check all ticks match marks
If you have not placed any annotation near the end of a long answer then place R to show that the whole answer has been read
Read the full sentence/answer before marking it
Any blank pages place one SEEN annotation

If an answer is left blank then use SEEN and award NR, but if anything has been written for example 'Don't know', '?' etc. then use NAQ and award 0. If an answer has been attempted and crossed out then attempt to mark it.

Please make sure you have read the most up to date (10th May) AE guide before you start marking.

Question	Answer	Marks
1	RAM ROM	**2**

Question	Answer	Marks
2(a)	Injuries from trip hazard	**1**
2(b)	RSI/Repetitive Strain Injury	**1**
2(c)	**One** from: Eye strain Headache	**1**
2(d)	Electrocution	**1**

Question	Answer	Marks
3(a)	**Two** from: It is a security method Form of security to protect the resources/data that the user can access Adds another layer of security	**2**
3(b)	**Two** from: Security token Biometrics GPS signal Receive/send a code you have to enter by email/SMS Username and Password Credit card number Phone number/email address Dongle/security app	**2**

Question	Answer	Marks
4	Max **five** from: ***Positive*** Travel becomes safer Allows the driver to concentrate more on the driving Helps to prevent human error Keeps pedestrians and other people safe Can avoid accidents Max **five** from: ***Negative*** Become very reliant on the technology Very costly to repair/maintain Makes the vehicle more expensive The device/microprocessor could stop working/misread causing injuries Error messages/alerts could distract the driver	**6**

Question	Answer	Marks
5(a)	**Two** from: **GUI** Is a WIMP system More user friendly Can be customised more easily Has limited options They are intuitive **CLI** The user has to type in commands The user needs a good knowledge of commands/system Users need to remember/learn the commands	**2**
5(b)	**Two** from: Dialogue based Gesture based	**2**

Question	Answer	Marks
6(a)	**Two** from: This is a communication system A structured discussion between two or more people This is carried out virtually/online/over the internet Involves video, web and audio	**2**
6(b)	Max **three** marks for any devices in the answer Max **two** marks for <u>linked</u> reasons: Computer/smartphone … …to connect the peripherals used in the conference Camera/webcam… …to capture moving images of the conference/participants Monitors… …to view the participants/contents/web page of the conference Microphone… …to capture the audio of the conference/participants Speaker/headphones… …so participants can listen to others in the conference Router… …to connect to the internet	**4**

Question	Answer	Marks
7(a)	Max **three** from: **Benefits of using laptop computers** It has a large screen making it easier to read back the notes The software used is more compatible with other devices More ports on a laptop therefore easy to transfer data Has a large/separate keyboard therefore less errors on data entry//Has a large/separate keyboard therefore making it easier to type in the data Max **three** from: **Drawbacks of laptop computers** Laptops are less portable More difficult to take pictures using a laptop Laptops need a flat surface to work on Large footprint Smartphones can use 4G/5G/mobile data	**4**
7(b)	**Four** from: Text size should be easy/large enough to read Font style should be easy to read Make good use of white space so data fills the certificate Enough space in which to enter the answers in the text boxes Make good use of colours to make it easy to read Use an organised layout to make it easy to read All information needs to be clearly visible Use of tick boxes to make data entry quicker/easier	**4**

Question	Answer	Marks
8(a)	**Two** from: Virtual Reality is completely computer generated world Virtual Reality may require a headset/goggles Virtual Reality only enhances a fictional reality Augmented Reality can be accessed with a smartphone Augmented Reality combines both the virtual and real world Augmented Reality creates a new layer on top of existing reality	**2**

Question	Answer	Marks
8(b)	**Six** from: It can help people connect with others to improve communication skills Overlays information/warnings on the display therefore leads to safer activities Produces more efficient/engaging shopping as user could look at a product and information can be displayed The user can try on clothing electronically so you can see what the clothes look like (on you) before buying Used in walk through systems to give a greater experience for users Using it in (interactive) gaming could allow people to have a better experience of the game As it is used in gaming it could lead to safety issues as the player could be immersed in the game Could damage social relationships/skills as it removes face to face interaction On screen information could be distracting Allows us to interact with various characters/situations in real-time but not necessarily the real life	**6**

Question	Answer	Marks
9(a)	**Three** from: The user interface is the screen into which the user types the answer Outputs questions for the user to answer Outputs the results to the user Interacts/communicates with the user Allows the expert to enter information into the knowledge base	**3**
9(b)	**Three** from: The knowledge base is a database of information Collection of facts/information/rules Populated by experts It contains the rules base	**3**

Question	Answer	Marks
10	**Four** from: Data are sent back to the sensor The sensors scan continually The sensor captures the reflected data The sensor captures analogue data The data from the sensor is sent by the ADC	**4**

Question	Answer	Marks
11(a)	**Five** from: **Parallel running** Both systems operate together until the old one is removed Staff can be trained on the whole system gradually More time consuming to enter data into two systems If the new system fails then the old system is there for a while to be used It is more expensive as two sets of staff are needed It is more expensive as two systems are needed **Pilot Changeover** Each branch is implemented separately Each branch changing over only uses the new system Costs are reduced as only one branch is affected at a time If there is an error in the new system only one branch is affected Staff can be trained in the branch being implemented The changeover is easier to manage	**5**
11(b)	**Three** from: Purpose of the system Limitations of the system Program/coding listing Program/coding language Program flowcharts Algorithms System flowcharts Hardware requirements//Software requirements File structures List of variables Input format Output format Sample runs/test runs Validation routines	**3**

Question	Answer	Marks
12(a)	**Two** from: Watching/spying on the user entering the password/data Watching/spying on the user to memorise the data/password People can eavesdrop/listen when personal data is being exchanged	**2**
12(b)	**Two** from: Cover the key pad when entering the password When entering your password in a public place, sit with your back to the wall//Enter password when no one is nearby Unclick show password Use biometrics Use contactless cards	**2**

Question	Answer	Marks
13(a)	Double (data) entry	**1**
13(b)	**Four** from: An input device sends data to a computer for processing An output device receives data from the computer An output device displays the results of processed data Input devices are controlled by the user Output devices are controlled by the computer	**4**
13(c)(i)	QR (Code) reader/scanner	**1**
13(c)(ii)	Bar code reader/scanner	**1**
13(c)(iii)	Magnetic strip(e) reader/scanner	**1**
13(c)(iv)	RFID reader/scanner	**1**

Question	Answer	Marks
14	**Three** from: More robust Faster data access times Faster data transfer times Faster read and write speeds Less likely to be affected by magnetic fields	**3**

Question	Answer	Marks
15	**Four** from: It provides guidance/best practice rules for organisations to follow on how to use personal data Regulates the processing of personal data Protects the rights of the data subject Helps to prevent personal data being misused by third parties Protects personal data	**4**