



Cambridge IGCSE™

INFORMATION AND COMMUNICATION TECHNOLOGY

0417/01

Paper 1 Theory

For examination from 2023

MARK SCHEME

Maximum Mark: 80

Specimen

This document has **10** pages. Any blank pages are indicated.

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 descriptors 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 abbreviations

- / 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.

Question	Answer	Marks
1	Processor Sound card	2

Question	Answer	Marks
2	Two from: RAM can be read from and written to RAM is volatile memory RAM is temporary storage	2

Question	Answer	Marks
3	D	1

Question	Answer	Marks
4(a)	Radio Frequency Identification/RFID reader	1
4(b)	Optical Mark Reader/OMR	1
4(c)	Bar Code reader/scanner	1

Question	Answer	Marks
5(a)	Three from: Temperature sensor Humidity/moisture sensor Light sensor pH sensor	3
5(b)	Two from: So that the data from the sensor can be understood by the computer The output from a sensor is analogue The input to the computer is digital	2

Question	Answer	Marks
6	Four from, for example: Global Positioning System//satellite navigation Calendar Video calling Social networking Online banking Emails Playing and streaming videos/music Text messaging Searching the internet Taking photos Gaming Control of home devices Language translation	4

Question	Answer	Marks									
7(a)	<p>Normal Data is within the range of acceptability</p> <p>Abnormal One from: Data outside the range of acceptability Data that is of an incorrect type</p> <p>Extreme Data that is on the boundary/limit of acceptability</p>	3									
7(b)(i)	<p>Four from: The cloud has greater storage capacity The data could be sent directly to/from the cloud from any computer/device Storage capacity can be increased without adding additional physical devices Many people can share the data The school would only pay for the storage used There is an automatic backup of data</p>	4									
7(b)(ii)	<p>Three from: More security issues as multiple copies of the data are stored The school loses control over the storage of the data Cloud storage has an ongoing cost Users must have a reliable internet connection to store data Users must have an internet connection to access data</p>	3									
7(c)	<table border="1"> <thead> <tr> <th></th> <th>Health problem</th> <th>Possible solution</th> </tr> </thead> <tbody> <tr> <td>Using a mouse for a long period of time</td> <td>Repetitive strain injury</td> <td>Use a wrist rest Take regular breaks Use a trackerball//an ergonomic mouse Hand exercises Voice activated software</td> </tr> <tr> <td>Sitting for too long in one position</td> <td>Back problems</td> <td>Use a foot rest Take regular breaks Walk around//stand up Use an ergonomic/adjustable chair Sit with correct posture//with straight back</td> </tr> </tbody> </table>		Health problem	Possible solution	Using a mouse for a long period of time	Repetitive strain injury	Use a wrist rest Take regular breaks Use a trackerball//an ergonomic mouse Hand exercises Voice activated software	Sitting for too long in one position	Back problems	Use a foot rest Take regular breaks Walk around//stand up Use an ergonomic/adjustable chair Sit with correct posture//with straight back	4
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Question	Answer	Marks
8	<p>Three from: Extranet is a network controlled by a company Restricted/private network Allows access for partners/vendors/suppliers Allows access for authorised customers</p>	3

Question	Answer	Marks
9	<p>Four from:</p> <p>The position/location of the car is <u>calculated</u> using GPS software</p> <p>Data is transmitted/sent to the office computer</p> <p>Data is transmitted every few seconds</p> <p>An algorithm calculates the speed/location of the cars</p> <p>The data is stored/saved in the computer</p> <p>The map is updated every few seconds</p>	4

Question	Answer	Marks
10(a)	<p>Microphone</p> <p>Video camera/webcam</p> <p>Speakers/headphones</p>	3
10(b)	<p>Three from:</p> <p>Ensure the video camera/webcam, microphone, speakers/headphones are switched on</p> <p>Ensure the hardware devices are connected</p> <p>Carry out tests on the microphone, video camera/webcam and speakers/headphones</p> <p>Adjust the video camera/webcam so the headteacher can be seen</p> <p>Check the volume levels</p> <p>Check internet connectivity</p>	3

Question	Answer	Marks
11	<p>Four from, for example:</p> <p>Microprocessor-controlled devices reduce the need for people to do manual tasks at home</p> <p>People can use microprocessor-controlled devices for physical fitness tracking in the home</p> <p>People have more time to spend on leisure activities/shopping/socialising</p> <p>Increased sense of security as homes are protected with burglar alarms/smoke alarms/fire alarms</p> <p>Smart fridges can be used to improve healthy lifestyle//Smart fridges automatically order fresh food//Smart fridges reduce food waste</p> <p>Microprocessor-controlled devices can be set <u>remotely</u> using a smartphone</p> <p>Saves fuel as the heating/air conditioning is not on all day</p> <p>Reduces injuries by using microprocessor-controlled lights outside</p>	4

Question	Answer	Marks
12	<p>Four from, for example:</p> <p>Tawara Retail can target prices, products and services at specific groups based on buying data</p> <p>Tawara Retail can update stock availability/prices more quickly than a physical store through their website</p> <p>Cheaper to publicise special offers rather than mail shots</p> <p>International customer base//global market</p> <p>Increased profits/lower prices due to lower overheads/fewer staff</p>	4

Question	Answer	Marks
13	<p>Two from:</p> <p>Medium is full Corrupt card Write error Card error Card not initialised Virus found on the card Device not recognised</p>	2

Question	Answer	Marks
14	<p>Max three from:</p> <p><i>Similarities</i></p> <p>Both use wireless communications Both use radio frequencies for communication Both allow several devices to be connected Both use security when sending data</p> <p>Max three from:</p> <p><i>Differences</i></p> <p>wi-fi has a faster data transfer rate wi-fi has a greater range of transmission wi-fi uses key matching encryption Bluetooth uses WEP and WPA security together wi-fi can be broadcast wi-fi connects more devices Bluetooth has a lower frequency than wi-fi</p>	4

Question	Answer	Marks
15	<p>Max five from:</p> <p><i>Advantages</i> Reduces the number of journeys to and from the bank Saves money as fewer journeys are made travelling to the bank Reduces the time wasted travelling to the bank/waiting in queues The interest rates may be better using internet banking Easier to shop around for the better bank accounts 24/7 banking No physical robberies of customers</p> <p>Max five from:</p> <p><i>Disadvantages</i> Security is an issue as transactions are carried out over the internet/ unsecured networks The user needs a <u>reliable</u> internet connection <u>More</u> risk of pharming/phishing/fraud Easier to make errors whilst using internet banking e.g. incorrect input If the internet connection drops during a transaction, then there may be issues Device needed for two-factor authentication Physical money/cash cannot be deposited or withdrawn using online banking</p>	6

Question	Answer	Marks
16	<p>Three from:</p> <p>Ethnic/racial origin Religion/philosophical beliefs Political views/opinions Membership of a political party Membership of a trade union Sexual orientation Criminal record Health/medical record Genetic data/DNA Biometric data</p>	3

Question	Answer	Marks
17	<p>Four from:</p> <p>Don't give out other people's personal information such as address or phone number Don't send inappropriate images to anyone Don't open/click on suspicious links/adverts on social media Don't become online 'friends' with people you do not know//don't contact/chat to people you do not know Never arrange to meet someone in person who you only met online If anything you see or read online worries you, you should tell someone about it/block them Use appropriate language Set security so only friends can contact you</p>	4

Question	Answer	Marks
18(a)	<p>Max five from:</p> <p><i>Advantages</i> Bookings can be made last minute 24/7 booking The bookings can be easily checked on the internet Faster to cancel/change a booking The patient cancels/changes their own appointment which ensures it has been done Multiple bookings can be made for different medical units Email/text reminders can be sent automatically More convenient – can book from any device/on the move Automatic confirmation of the booking Less time spent on the phone therefore freeing up staff The bookings can be planned easily in advance Reminders can be sent via email/text therefore reducing cost of posting them Repeat appointments can be made automatically therefore saving time Frees up staff to do other things</p> <p>Max five from:</p> <p><i>Disadvantages</i> Concerns about the privacy/security of the data If the system goes down the ability to book an appointment is lost Some people prefer to talk to a medical person Medical emergencies may be overlooked Internet connected device required by patient Computer skills required Administration staff may lose their jobs</p>	6
18(b)	<p>Three from:</p> <p>Inference engine Knowledge base Rules base User interface Explanation system</p>	3

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