Cambridge IGCSE™

INFORMATION AND COMMUNICATION TECHNOLOGY	**0417/12**
Paper 1 Theory	**February/March 2022**
MARK SCHEME	
Maximum Mark: 100	

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 February/March 2022 series for most Cambridge IGCSE™, Cambridge International A and AS Level components and some Cambridge O Level components.

This document consists of **10** printed pages.

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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.

Question	Answer	Marks
1(a)	Physical components of a computer system	**1**
1(b)	**Two** from: Microphone Camera Sensors	**2**
1(c)	**Two** from: Compiler Linker Operating system Utilities Device driver Interpreter	**2**

Question	Answer	Marks
2	Bank card Medical record	**2**

Question	Answer	Marks
3(a)	**Four** from: *ROM* Read Only Memory Non-volatile//Data is not lost when the computer is switched off Used to store the startup instructions/BIOS *RAM* Random Access Memory Volatile//Data is lost when the computer is turned off Stores the current running program/instruction RAM can be written to and read from **To gain full marks the description must have correct answers for both ROM and RAM**	**4**
3(b)	**Three** from: The startup of the laptop is faster SSDs consume less power than HDD so conserves battery power Reduces the weight of the laptop as SSD is lighter Makes the laptop more compact	**3**

Question	Answer				Marks
4		Control	Measurement	Modelling	4
	Maintaining the growing conditions in a glasshouse	✓			
	Aircraft flight simulation			✓	
	Monitoring the pollution in a river		✓		
	Using What-ifs			✓	

Question	Answer	Marks
5(a)	**Four** from: WWW is a collection of information pages/websites/web pages WWW is part of the internet WWW is accessed through the internet WWW is a service on the internet Internet is a global network of networks/Wide Area Network Internet is the infrastructure **To gain full marks the description must have correct answers for both WWW and the internet**	4
5(b)	**https://** **One** from: This is the hypertext transfer protocol secure Set of rules/protocol to transfer web pages securely **cambridgeinternational** The domain name **.org** **One** from: The top-level domain name Registered as an organisation **/IGCSE** The folder/sub-directory in which the work is stored on Cambridge International's server	4

Question	Answer	Marks
6(a)	**Four** from: The location of the smartphone is calculated using GPS software Signal is transmitted by the satellite Signal is sent almost continuously The data is saved in the smartphone The coordinates of the smartphone are shown on the smartphone screen	**4**
6(b)	**Three** from, for example: Real time aircraft/ship/drone position Tracking delivery/stolen vehicles Ploughing fields Surveying Military Sat-nav in vehicle to reach a destination	**3**

Question	Answer	Marks
7(a)	**Eight** from: **Advantages** Prevents double booking/overbooking The booking staff can see immediately if the concert is fully booked Bookings can be made 24×7 Usually cheaper as lower/fewer overheads Booking staff can more easily see the seats that are available **Disadvantages** Requires the school to purchase expensive hardware Setting up is more expensive Maintenance is more expensive Internet access is needed to run the booking system therefore the cost may be increased More reliant on hardware **To gain full marks the discussion must have correct answers for both advantages and disadvantages**	**8**
7(b)	Direct changeover	**1**
7(c)	**Three** from: Benefits are immediate Cheaper as there is only one set of staff Less chance of the new system being faulty as it is thoroughly tested Only one system in operation therefore data is not duplicated	**3**

Question	Answer	Marks
8	**Six** from: *Advantages* Smartphone can access the internet in more places Smartphone is more likely to retain the connection whilst on the move They can access the internet quickly as they are more likely to have the smartphone with them *Disadvantages* Websites displayed on the smartphone are not full versions of the website Browsing/reading the website is more difficult due to smaller screen size More difficult to type in/navigate the websites/emails due to smaller onscreen keyboard As children can access the internet from anywhere it leaves them more vulnerable to exploitation **To gain full marks the description must have correct answers for both advantages and disadvantages**	**6**

Question	Answer	Marks
9(a)	**Part-time** Working fewer hours a week… …than full time staff	**2**
9(b)	**Compressed** Works the required hours in a week… …in a fewer number of days	**2**
9(c)	**Three** from, for example: Wrist rest Ergonomic keyboards Ergonomic chairs Footrests Ergonomic mouse LCD/TFT/LED/anti-glare screens Voice activated software Adjustable monitors	**3**
9(d)	**Two** from: Tripping over trailing cables Fire caused by overheating computers Fire caused by overloaded sockets Electrocution caused by spilling drinks on the computer Electrocution caused by touching live wires Injuries caused by equipment falling	**2**

Question	Answer	Marks
10	**Six** from: ***Advantages*** The footprint of the computer will be smaller Fewer peripherals needed therefore saves money Makes the computer lighter Easier to select icons ***Disadvantages*** If the screen is damaged, then the device cannot be used to input data Keyboards and monitors can be replaced more easily Large fingers could mis-key data therefore more errors on data entry Screens can become dirty more easily therefore affects reading of data **To gain full marks the description must have correct answers for both advantages and disadvantages**	6

Question	Answer	Marks
11(a)	Legal	1
11(b)	Ethical	1

Question	Answer		Marks
12(a)	**Field name**	**Data type**	6
	Vehicle_licence_plate	Text/alphanumeric	
	Powered_by	Boolean	
	Service_interval	Numeric:Integer	
	Cost_of_service	Numeric: Currency	
	Model	Text	
	Date_of_service	Date	

Question	Answer	Marks
12(b)	**Six** from: ***Advantages*** Service details only need to be entered once into the database Mistakes are less likely to happen when entering data if it already exists Uses data redundancy Data can be accessed using key fields Uses data flexibility Uses data integrity Uses data consistency Better security due to user level access control Caters for future requirements ***Disadvantages*** Relational databases can be more complex Requires training to set up Harder to set up Requires a data administrator therefore increasing the costs **To gain full marks the discussion must have correct answers for both advantages and disadvantages**	**6**
12(c)(i)	Presence check To make sure that it has been entered as its unique Format check To fit in with the layout	**2**
12(c)(ii)	Type check Digits only Range check Between 1500 and 5000	**2**
12(c)(iii)	Format check To ensure it is dd/mmm/yyyy Range check To ensure it is between certain dates Length check Maximum of for example 11 characters (could be 8 or 6)	**2**

Question	Answer	Marks
13(a)	Network cards Router Switch/hub	**3**
13(b)	**Three** from: Email Online chat//Instant message VOIP Online conference Streaming music/video/TV on demand Gaming Use of the Cloud Newsgroups FTP	**3**
13(c)	**Two** from: Information can be unreliable Unregulated so anyone can post anything More difficult to find what you are looking for Vast amount of information//Information overload Information can be biased/inaccurate Its slower to find relevant information Data may be out of date	**2**
13(d)(i)	**Two** from: User id and password can sometimes be easily guessed Passwords can be hacked with key logging software Passwords can be hacked by using random password generators Others can see the details being typed in If the home computer saves the log in information, then anyone can access If the user does not logout, then others can access data	**2**

Question	Answer	Marks
13(d)(ii)	**Way 1:** One-use code/token Arjun logs in then software generates a one-use code/token Arjun enters the code/token into the system Even if hacker intercepts code/token is no use as can only be used once Token is time limited **Way 2:** Card/dongle The user has a dongle/card which is inserted into the computer The dongle/card is read by the computer The dongle/card data is unique **Way 3:** Biometrics Using biometric scanner to capture digital image of fingerprint/retina/iris/face Each biometric is unique Biometrics are nearly impossible to forge **To gain full marks the answers must correctly describe two ways**	**4**