GCE AS MARKING SCHEME

SUMMER 2019

**AS (NEW)
INFORMATION AND COMMUNICATION
TECHNOLOGY - UNIT 1
2530U10-1**

INTRODUCTION

This marking scheme was used by WJEC for the 2019 examination. It was finalised after detailed discussion at examiners' conferences by all the examiners involved in the assessment. The conference was held shortly after the paper was taken so that reference could be made to the full range of candidates' responses, with photocopied scripts forming the basis of discussion. The aim of the conference was to ensure that the marking scheme was interpreted and applied in the same way by all examiners.

It is hoped that this information will be of assistance to centres but it is recognised at the same time that, without the benefit of participation in the examiners' conference, teachers may have different views on certain matters of detail or interpretation.

WJEC regrets that it cannot enter into any discussion or correspondence about this marking scheme.

GCE INFORMATION AND COMMUNICATION TECHNOLOGY

SUMMER 2019 MARK SCHEME
GCE IT1

Q	Section A	Marks
1.	**Award 1 mark** for definition of data **and 1 mark** for definition of knowledge	2
	Data consists of raw facts and figures/ figures without meaning *Knowledge* is derived from information by **applying rules** to it.	2x2
	Award 1 mark for example of data **and 1 mark** for example of knowledge x2	
	Example: **Data** 1 63.6, 2 59.3, 3 59.7 **Knowledge:** Swimmer 2 is the fastest and consequently wins.	
	Example: **Data,** John's 11052001 **Knowledge,** John is 18 and so now he can vote in the next election.	
	The rule must be stated or implied. (answer to show two stages) and evidence of application of rule.	

Q	Section A	Marks
2.	**Award 1 mark** for <u>description</u> and **Award 1 mark** for relevant example, x3 (max 6 marks)	3x2

Term need not be there if description is clear what it is about.
No marks just for stating the term.

<u>Description</u>
Correctly targeted - The question should be targeted at the people who are going to use it

Examples
- If asking for information about motorbikes there is no point asking car drivers.
- No good asking vegetarians about meat eating.

<u>Description</u>
Complete – There is nothing missing from the data (no gaps)

Examples
- The post code is not missing as this would delay the delivery of the letter.
- The data on the sales of every salesman so that reliable decisions can be made on what areas to develop in or which salesman to sack.

<u>Description</u>
Relevant - Data has to be <u>related</u> (not must have a purpose) to the task you are trying to investigate.

Examples
- There is no point using information about babies from people whose children are in their late teens.
- No good collecting information on ice-cream sales in Alaska in the winter if you want to open your kiosk in California.

<u>Description</u>
Up-to-date - Information changes with time and without a date stamp could be too old to be useful OR means that the data is not too old to be useful.

Examples
- A travel company would not have much profit from using 10 year old data on holiday patterns to decide which resorts to offer this year.
- Using a five year old mailing list might end up in letters being sent to dead people or people who have moved.

(Time has to be either stated or implied).

NOT Understandable or Accurate

Q	Section A	Marks
3.(a)	**Award up to three marks for descriptions of methods** **Check digit** – using calculations on the account number to generate a new last number **Presence check** to make sure that there is a number in the account number field **Length check** on account number to ensure that the correct number of characters have been entered **Format check** on account number to ensure that there is one block of 8 numbers **NOT data type check, range check** **Can award 1 mark if all 3 are too general**	3
3.(b)	**Award 1 mark for check digit with a sensible reason i.e. value has to be an actual account number which has been used** **Accept but not expected: Hash total**	1

Q	Section A	Marks
4.	**Award 1 mark** for explanation of each advantage and **1 mark** for the example **up to a maximum of 6 marks** Advantages - each point must be illustrated with a suitable example. Must explain the advantage for the first mark and not just give the heading **Data storage capacity** - Millions of records can be physically stored in a very small hard disk (1) so reducing the need to buy or rent office space with many filing cabinets. e.g. all the information about students in a large college will fit on one small hard drive.(1) **Faster searching** - Records can be found instantaneously,(1) e.g. A company can find a sales transaction amongst its hundreds of thousands when a customer queries a delivery instantaneously.(1) **The ability to produce different output** formats - Information can be produced in tabular or graphical format (1), e.g. a scientist producing a report will include data in a table and to make some of them easier to understand will produce some of them as graphs.(1) **Ease of updating data** - Errors in data can be quickly changed without the need to retype everything (1) e.g. if someone changes their address the details can be altered quickly without having to re-write the whole record (1) **Allows predictive analysis** - To give better management statistics/information to help decision making (1) e.g. analysis of sales patterns will influence choice of stock sent to supermarkets. (1) **Security policies can be centrally administered / Easier to back up** data - which can be done centrally (1) e.g. Suitable backups can be performed at set times and in one fixed location, e.g. customer orders can be backed up on RAID systems (1) **Speed of data communications -** Messages sent out across the world instantaneously,(1) e.g. an email can be sent from the UK to the USA within seconds.(1) (speed of light) **NOTHING to do with handwriting** **NOTHING to do with data entry or collection** **List of three headings gains 1 mark**	3x2

Q	Section A	Marks
5.	**Award 1 mark per change or benefit (do not award the same benefit more than once)**	8
	Cloud Storage is a service where data is remotely maintained, managed, and backed up (1). The service allows the users to store files online, so that they can access them from any location via the Internet (1)./ reduces cost of data storage to an organisation (1)	
	Dropbox services allow you to easily share your documents, videos, and photos (1) and always have them on-hand when you need them.(1) / free for personal use	
	Collaborative working also known as joint or partnership working - covers a variety of ways that two or more organisations can work together. Options range from informal networks and alliances, through joint delivery of projects to full merger (1). Wider geographical reach or access to new beneficiary groups /Financial savings and better use of existing resources / Sharing the risk in new and untested projects (1)	
	Teleworking working from home using modern technology to keep in touch with your business (1) Reduced costs from not having to provide office space for the teleworker./ saves on travelling time and costs (1)	
	Email services such as voice mailboxes, address books, group sending, file attachments (1) **(need at least 3 for mark)** makes it easier to share documents (1)	
	Videoconferencing - save on travel time and cost (1) **Access to peoples profiles** -pre job interviews /facilitates search for talent(1) **Social media** – cheap advertising to wider audience (1)	
	Award marks for other benefits as long as they are business / work related.	

Q	Section A	Marks
6.	**Award up to 6 marks in total** **Award 1 mark for naming the development x2** **Award up to 2 marks for explanation or examples x2** **smart watches to monitor and measure fitness**, wearable devices that check how many steps you have taken in a day (1), / monitor your heart rate during different activities, / allows a person to monitor their fitness levels and see what they have to do to improve. **internal body medical delivery devices**, an expandable capsule able to deliver medication inside the body over a long period of time.(1) / Approximately 50% of patients don't take medication as prescribed and failing to do so lessens the effectiveness of a drug./ This convenience would eliminate the need for patients to adhere to strict regimens. **smart pills** consumable/digestible technology.(1) The technology development is currently focused on two primary functions: wireless patient monitoring and diagnostic imaging/ , a company has developed a system consisting of a smartphone, a sensor patch and a pill./ Each pill contains a one-square-millimetre sensor that is coated in two digestible metals: copper and magnesium/ Upon swallowing, the sensor is activated by electrolytes within the body. / The pill then transmits a signal to a small, battery-powered patch worn on the user's torso and sends the data via Bluetooth to a caregiver's or family member's smartphone. **Any reasonable answer addressing new technology in health care**	2x3

Q	Section A	Marks
7.	**Award up to 6 marks in total** **Award 1 mark for describing the type x2** **Award up to 2 marks** for advantages and **Award up to 2 marks** for disadvantages **Remote Gaming**	6

Remote Gaming

Description	Advantages
remote gaming playing games which are not stored on your computer (1)	• The main advantage of using a cloud based service is that you don't have to upgrade game software every time a new update comes in. And most importantly, you don't have to worry about system requirements for a new game upgrade.
	• **No Need for Expensive Hardware Investments or Upgrades** – With cloud gaming, you wouldn't need to upgrade your PC or console. Instead of buying an expensive gaming hardware, you'd just use your existing hardware. You could also buy a cheap streaming box and controller that plugs into your television and home network. • **Play Games on Any OS or Device** – The majority of high-end, non-mobile games are currently chained to PCs (often Windows) or consoles. Cloud gaming would allow games to become more platform-independent, allowing PCs and tablets running Mac, Linux, Android, iOS, Chrome OS, Windows RT, and other operating systems to play games that might otherwise only run on Windows. • **Integrate Gaming Into TVs and Other Devices** – Television manufacturers could integrate support for cloud-gaming services into their smart TVs. The TV wouldn't need any powerful, expensive gaming hardware — any TV with the correct software and a controller could work for gaming without any additional boxes required. Some smart TVs already include this feature via their OnLive integration. • **Instant Playing** – Some games may require a download of 10GB, 20GB, or even more before you can play them. Cloud gaming would allow you to start playing games instantly, as the server already has the game installed and can start playing it immediately. • **Easy Spectating** – Cloud gaming services would allow for very easy spectating of games, such as professional gaming matches. Spectators wouldn't need the

Q	Section A	Marks
	game installed, as the video stream could be easily duplicated for many users. • **DRM** – If games ran on remote servers instead of your own computer, they'd be almost impossible to pirate. This makes cloud gaming an attractive form of DRM to publishers, if not to gamers.	
	Disadvantages	
	• **Video Compression** – Just as videos we watch on YouTube or Netflix are compressed to make them take up less bandwidth, the gameplay "video" you receive from a cloud-gaming service is compressed. It won't be as sharp and high-detail as what could be rendered by a high-end gaming PC. However, the compressed video you receive may look better than a game rendered at lower detail locally. • **Bandwidth** – Cloud gaming services require a large amount of bandwidth. Playing a game on OnLive may use more than 3GB per hour in bandwidth. If you have bandwidth caps on your Internet connection, this could be a serious problem. If everyone played games using cloud services, bandwidth usage would increase dramatically. • **Latency** – There's no getting around it — games can react to your actions much more quickly when they're running on your local computer. Reaction time is faster when your mouse movement just has to reach your computer than when it has to travel over an Internet connection, be rendered and compressed, and then travel back to you. Cloud-gaming services will always have more latency than powerful local hardware. • **DRM** – Publishers love the DRM results of cloud gaming, but many gamers would be at a disadvantage if cloud gaming became the primary way to play games. Just as it's impossible for people living in certain areas to play always-online games like Diablo 3, cloud gaming would have even higher Internet connection requirements.	

Q	Section A	Marks
	Multi-player games	

Description	Advantages
Multiplayer games are games played by more than one person by means of a computer and an internet connection or multi-player consoles which allows players to play in similar game setting at the same time (1).	• It serves as an avenue for players to benefit from interactions with another person by either as forming of a joint venture or competition. This also allows them to have a form of social communication. • **Promotes Association:** Multiplayer games allow players to build their own networks of alliance. This promotes interaction within the players since they need to support each other in order to win the game. This will also allow players to build teamwork in order to attain victory. • **Boost Self Reliance**: Multiplayer online games will also contribute in boosting one's self confidence since this type of gaming not only limited for forming groups or teams but as well as in developing competition within each player. This will entice each to do better as reward points are still given individually to those players who show off throughout the game. • **Improves Social Interaction Capacity:** Since this permits alliances and competition, this will surely improve a player's social interaction capacity as it allows supervision of co-players activity, resources and skills. Players will also be required to communicate with one another in order to achieve a common goal or have a good fight. • **Most exciting game experience:** Multiplayer gaming will promise you to practice a more exciting game experience since you are now dealing or fighting with other individual unlike in a typical one-player game which only put up a fight between you and the computer. Having an alive competitor

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Q	Section A	Marks
	Disadvantages	
	Requires long hours of playing: Since you are playing with multiple other players, you cannot just stop from playing because this will affect the network. Typically, this will require you to play in long hours depending also o your co-players playing the game. **Incurs health hazards:** Due to the long hours of playing, numerous health problems may be acquired such as eye or carpel tunnel syndrome, poor postures and severe stress on joints and nerves. Everybody should be aware that there are real health hazards involve in spending too much time in front of the computer. **Allows players to avoid face to face interaction/ losing social life (but not if opposite given as an advantage)** **Meeting dangerous people/ grooming** **Cyberbullying**	

Q	Section A	Marks
8.(a)(i)	**Award up to 2 marks** for each explanation A barcode is a series of light and dark bars of differing widths (1) With a code number printed (underneath) (1) / or giving at least 3 parts of it e.g. part, manufacturer, country A QR code (short for "quick response" code) is a type of barcode that contains a <u>matrix</u> of dots (1) / a square of light and dark squares (instead of matrix) A two dimensional barcode (1)	4
8.(a)(ii)	**Award up to 1 mark** for advantage and **Award up to 1 mark** for disadvantage **Advantages** **Ease Of Use** What's great about QR codes is that they can be added to virtually anything you can imagine, from cereal packets to advertisements on the underground. This level of versatility can prove immensely helpful for advertisers and marketers. **Range Of Uses** QR codes can be used in hundreds of different ways. QR codes can also be used to provide a better user experience in museums, restaurants, on display printing and in other manners. **Easily Trackable** The use of web analytics and unique codes for different purposes enables marketers to gain valuable insight regarding the performance of their marketing campaigns, making it easy to figure out what works and what falls short of expectations. **Send Mobile Users To Promotional Content** As the name implies, QR codes are meant to offer a quick response mechanism to point users toward the right direction, saving them the time and energy required in typing a URL. When used effectively and alongside other mobile optimization strategies, these codes can pique the attention of users at the precise moment when they have shown interest in a particular video or advertisement. This usually translates to higher conversion and opt-in rates, enticing users to subscribe to an email list and receive promotional messages in the future. **Playing With The Curiosity Of Mobile Users** Perhaps this is a result of QR codes being relatively new, and this effect may wear off once they become widely used by brands. But right now, mobile users couldn't help but scan a QR code, simply to find out where it would lead them. **Extremely Cost-Effective** QR codes may seem too complicated, but creating them wouldn't put a dent in businesses' marketing budget. **Each code is unique** **Speed** Gives you information quicker than having to tyoe it in **Holds more information than a bar code**	2

Q	Section A	Marks
	Disadvantages **Alternatives Abound** There are plenty of alternatives to QR codes, and some say that these can provide a higher level of user experience. One such example is Blippar, which utilizes the creative itself such as a product image or brand logo as the trigger for interaction. **A QR Code Reader Is A Must** For many, this is the biggest downside to using QR codes. Mobile users have no choice but to download a QR reader before they can start scanning. Although there are a lot of free apps out there, this can still limit the number of users who can access the codes. But this may not be a problem in the near future. Many brands have started to incorporate QR readers in their mobile apps. It also shouldn't be a surprise if smartphone manufacturers start offering devices with a built-in reader. **Scanning Can Take A Long Time** Mobile users have to take out their phone, launch their reader, scan the code, and wait for it to direct them to the landing page. Those with a fast and stable internet connection shouldn't have any issues with this, but those who only rely on 3G may prove to have a less then optimal user experience. **Lack Of Awareness** An increasing number of businesses make use of QR codes, but only a handful of the population uses them. According to comScore, 14m US consumers use QR codes, but this only represents 6.2% of the total number of mobile users in the US. This figure also includes barcode scanning. Consumers have different purposes for scanning barcodes compared to scanning QR codes, making the seemingly huge figure rather misleading. **Damaged** Torn or damaged codes will not work and users could get frustrated	
8.(b)(i)	**Award up to 4 marks for any 4** **Must not be vague** Any four of: Processes • Code matched on stock database. • One deducted from stock database / Item sold decreases record by 1. • checked / matched / compared against reorder level. • if below level automatic request sent to supplier. (computer generated) • stock delivered. • stock database updated.	4

Q	Section A	Marks
8.(b)(ii)	**Award up to 2 marks for advantages and award up to 2 marks for disadvantages** **Advantages (any 2):** • Smaller storage / warehouses needed as not much stock held • Store is better able to respond to changing demand • Easier to cope with several small deliveries (less staff) than 1 big one. • Do not run out of fast selling items • Less risk of stock being out of date/waste (NOT no running out of stock) **Disadvantages (any 2):** • Expensive to introduce/set up • More admin staff as store responsible for own ordering • True stock may differ because of theft, wastage, damage, etc. • Cannot respond to unusual demand • Disruption to transport • Communication failure if qualified (not just 'internet down / internet failure') • Increased pollution from transport	4

Q	Section A	Marks
8.(c)(i)	**Award up to 2 marks** It's a method of wireless data transfer that detects and then enables technology in close proximity to communicate without the need for an internet connection. (1) it's an app which gives users the ability to link up their credit and debit cards and then use their phone with contactless readers. (1)	2
8.(c)(ii)	**Award up to 1 mark** for advantage and **Award up to 1 mark** for disadvantage **Advantages of NFC:** **Convenient:** The convenience of payment is one of this system's greatest advantages. NFC makes it very easy for users to make instant payment via their smartphones and tablets, using their mobile wallet. This process of payment is also simple to understand and use. It helps users perform financial transactions at the mere touch or tap of their screen. **Versatile:** NFC is very versatile, in that it covers a range of different industries and services. This mode of payment can be used for the purposes of mobile banking, reserving restaurant seats and movie passes, booking train tickets, getting real-time updates on expenditure and reward points, redeeming rewards and coupons and much, much more. **Better User Experience**: This system is beneficial for enterprises too – companies that readily adopt the latest technology are viewed by customers as being dynamic and progressive. Using this technology also helps them serve their customers better by presenting them with an easy and hassle-free mode of payment. Offering better user experience helps establishments enhance their own productivity and efficiency, thus enabling them to sustain customer loyalty, while also attracting newer customers. **Seamless:** NFC has been found beneficial in the academic arena as well. The high level of encryption enables institutions to employ it as a sort of a security system, which does an accurate ID on students entering and exiting the premises. Employees of companies use this technology to seamlessly interact in the office environment, sharing real-time information with each other. **More Secure:** Using mobile wallets is, to an extent, safer than using physical credit cards. In the unfortunate event of theft of the mobile device, the user's credit card information is password and PIN protected. This adds on an additional layer of safety. Also, NFC-enabled payment cards are built to be more secure than the magnetic strip of a regular credit card. While using this system of payment, retailers would have no physical access to customers' credit card information. **Speed**: Quicker payment so saves on queueing time	2

Q	Section A	Marks
	Disadvantages of NFC: **Expensive:** It may prove to be much too expensive for companies to adopt NFC-enabled technology; to purchase and maintain related machines and other equipment. While large and well-established companies such as Starbucks have successfully incorporated the technology within itself; the smaller companies could find it difficult to sustain their existing turnover and enhance profits. Installing the hardware and software and hiring technicians to maintain the same could result in spiralling expenses for the concerned company. **Not Advantageous Enough:** Most of the latest smartphones and tablets are NFC-enabled. This should have encouraged retailers and B2B companies to readily adopt this system. However, due to cost issues and other complications, not many smaller and mid-sized companies are prepared to receive the latest technological developments. Unfortunately, these companies and retailers are at a disadvantage, as they stand to lose current customers looking for easier, more integrated and contactless methods of payment. **Lack of Security:** While NFC transactions are undoubtedly more secure than regular credit card payments, this technology is not completely free from risk. Rapid evolution in technology always comes with an equally powerful negative consequence. Mobile phone hacking is now rampant and attackers are coming out with newer methods to gain unauthorized access into users' personal, social security and financial data stored therein. This makes the entire system vulnerable and insecure. The obvious lack of security could discourage both users and companies from warming up to this technology in the near future. Can still pay for goods from a stolen device without using a password.	

Q	Section A	Marks
9.	**Award up to 2 marks** for advantages and **Award up to 2 marks** for disadvantages **Advantages** • Safer – nobody hurt • Much more flexible • Can explore different scenarios more easily **Disadvantages** • Could <u>oversimplify the situation</u> and not be accurate enough • Bad <u>error in formulas or data</u> will spoil accuracy • No model is ever 100% accurate	4
10	**Award up to 2 marks for the explanation, 1 mark for the example and 1 mark for an advantage** **Goal Seek** is a process of calculating a value by performing <u>what-if analysis</u> on a given set of values. (1) The feature lets <u>you adjust a value used in a **formula**</u> to achieve a specific **goal / outcome**(1). **OR** Part of what if analysis tool set (1) allows the user to use the desired result of a formula to find the possible input value necessary to achieve the result (1) **OR** Modify the input (1) to give a desired output (1). **Example (one mark)** Any suitable example e.g.: • Looking at the result of an election to see who you should have targeted • You have a fixed budget and you can use goal seek to find out how many people you can invite to a function within your budget. • Mortgage calculators to see what you can afford to pay each month • What should be your sales to achieve a certain profit **Advantage** Allows you to work out what you need to do when trial and error is not possible or not to waste money or time. (1) **A well-argued example can be awarded 2 marks**	4

Q	Section A	Marks
11.(a)	**Award up to 4 marks** **What (1) and Why (1) x2** Examples: My **Count** formula on page 5, cell D24, counts the number of numbers in cell range A23 to D23 (1) It can help you work out the mean of a set of numbers by giving you the number to divide the total by (1). COUNTIF, etc, are also acceptable **RAND** generates a random number between 0 and 1 (1) in my range, on page 10, it is used to generate the number of sales of hot cross buns in cell E25 (1) NOTE The use of RAND to generate a unique number is incorrect	4
11.(b)	**Award up to 2 marks** **What (1) and Why (1)** On page one you can see my user interface which allows customers to choose the section of the company that they want to work on (1) this makes it easier for a novice to navigate their way around the system (1). **Award 1 mark for** The standardised corporate identity colour scheme logo etc, which appeared on all spreadsheets and invoices and reports.	2
11.(c)	**Award up to 2 marks per section, maximum of 6**	
(i)	**SORT** **What and why** I sorted the names of my customers on page 13 as it made it a lot easier to look for people when their surnames **were** in alphabetic **order**/to make a list ready for Vlookup.	2
(ii)	**Search** **What and why** I used search on my sheet to find the crayons that my company sold (1) as I had a request for information of what different ones we sold and at what prices (1) **NOT** use of Find and Replace	2
(iii)	**LOOKUP and variations** **What and why** I used Vlookup in cell H14 on page 10 to find the price of the product (1) You can update a table of prices without having to rewrite formulas such as multiple IF statements. / Faster to automatically enter data (1) **Not** *'Error reduction'*	2