



GCE MARKING SCHEME

SUMMER 2018

**(LEGACY)
INFORMATION & COMMUNICATION TECHNOLOGY
IT3
1243/01**

INTRODUCTION

This marking scheme was used by WJEC for the 2018 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 & COMMUNICATION TECHNOLOGY

SUMMER 2018 MARK SCHEME

Q.	Section A Mark Scheme	Mark
1.	<p>Any three of the following, discussed in detail: 1 mark per factor - 1 mark per explanation. (No Factor no mark for extension) If mistake in factor but good extension can gain extension mark.</p> <p>Note: explanations must be distinctly different and match the factor. An example can count as an extension.</p> <p>NOT clear navigation structure, layout appropriate to the task or differentiation between user expertise NOT Consistent Layout NOT age</p> <p>Disabled Access (If get explanation and factor mixed up can gain 1 mark) e.g. If a person is blind then the computer could recognise voice input /Braille keyboard.(need disability)</p> <p>Consistency of signposting and pop up information e.g. Every 'Next' (navigation buttons) should be in the same place using the same icon / navigation around the program should be clear consistent and easy to follow. – intuitive, learn faster</p> <p>Customisable to suit the needs of the user e.g. Makes it more efficient if the user can change items to suit their work preference. Change font size – readability, appropriate to level of user (have to say why)</p> <p>Location of where machine is to be used e.g. No sound in a noisy area. Touch screens in museums / factories / etc (with explanation of why).</p> <p>House Style/Ethos (Not Consistent Layout) e.g. So that it conveys who the organisation is and all the company documents look/feel the same.</p> <p>On Screen / online helpfiles (built in with software) e.g. Rather than <u>wasting time</u> looking in manuals, important if no outside help available when working / tool tips telling the user what to do / interactive user manual that answers general FAQ. /Wizards or online tutorials to take you through the task. No marks if can be read as a Google search List of 3 = 1 mark</p>	3x2

Q.	Section A Mark Scheme	Mark
2.	<p>For each factor 2 answers are required</p> <p><u>Existing systems to integrate (any 2 from)</u></p> <ul style="list-style-type: none"> • More often networks are <u>not developed from scratch</u> but need to fit in with existing systems. • Sometimes an <u>extension</u> is required e.g. when a new branch office opens. • Therefore any new network must fit in with the existing <u>operating systems and protocols</u>. • It must support any <u>peripherals</u> already in use, e.g. bar code readers, printers, etc. • Can the <u>current stock of PC's</u> be used on the new network? <p>Performance in terms of: reliability / user friendliness / capacity /speed of processing</p> <ul style="list-style-type: none"> • Different parts of the organisation may have different performance requirements. • Real-time e-commerce system may require greater speeds / capacity /reliability. • Lots of storage space needed in commercial data processing applications as handling huge amounts of data • If the system is not reliable a bank for instance will lose a lot of money and reputation if there is a lot of downtime <p>NOT just 'faster networks A good example can cover these points</p>	2x2

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3.	<p>Answers should discuss the following factors of the two networks. Any 6 different comparisons but candidates only need to describe one side to get the mark.</p> <p>Only give <u>cost</u> factors once and <u>knowledge</u> factors once</p>	6																										
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4.	<p>Candidates should give two advantages and two disadvantages</p> <p>Advantages of Wi-Fi:</p> <ul style="list-style-type: none"> • Allows pupils and staff <u>the freedom of working anywhere</u> a signal can be received • Ideal for networks in <u>old listed buildings</u> where cables would not be allowed to be installed • Global <u>set of standards</u> (802.11) (for all devices). • Can use a <u>variety of devices</u> such as tablets, mobile phones, etc <p>Disadvantages of Wi-Fi:</p> <ul style="list-style-type: none"> • <u>Power consumption</u> is high – which means laptops soon exhaust their rechargeable batteries • There may be <u>security problems</u> even when encryption is used • Wi-Fi networks have a <u>very limited range</u> (e.g. 150 ft) /<u>black spots</u> in buildings • Can get <u>interference</u> if wireless network signals start to overlap • Transmission <u>speed slower than cable</u>. <p>NOT distraction from use of phone NOT broadband issues NOT cost and NOT health</p>	<p>2</p> <p>2</p>
5.	<p>Remote management is to do with <u>stations not users</u> One mark for each of any five points:</p> <ul style="list-style-type: none"> • Check to see right number of licences. • Setting regular times for virus scanning/ check virus scanning has been done • Check to see no unauthorised software loaded on machines. • Update software/rebuild software on stations / re-setup stations / re-install software • Install new items of software centrally • Send instant messages. • Guide users through problems. • Take control of stations. • Check on hardware to see what needs upgrading / updating • Check on components to see if any failing. • Shut down stations. <p>NOT manage passwords / delete files / other tasks normally done at the server OR Monitoring users/access NOT logging off users / clearing printer queues</p>	5

Q.	Section A Mark Scheme	Mark
6.	<p>Any four points for each section</p> <p>The advantages of teleworking to the company</p> <ul style="list-style-type: none"> • Smaller offices are needed • Fewer backup staff need to be employed (e.g. cleaners, caretakers) • Staff less likely to spend time off sick (Not never off sick) • Reduced office overheads (electricity, gas, insurance, furniture etc) either needs office overheads or example not just 'reduced overheads • Staff may be more amenable to working flexible hours • Retaining skilled workers / maternity • Employ workers from a wider pool of talent (anywhere in the world) • Comfortable environment can lead to greater productivity <p>The advantages of teleworking for the employee</p> <ul style="list-style-type: none"> • Teleworking makes it easier for people to live and work where they choose, as it is possible for (some staff to work from home) (less stressful) • It reduces traffic congestion and carbon dioxide emissions and is therefore 'greener' / this has an environmental benefit since there is no commuting to work • Not having to travel to work saves time/money • Flexibility of working hours / Work your own hours / Fit around family commitments / No need to take time off to see workmen • Ideal for disabled 	<p>4</p> <p>4</p>
7.	<p>Look for four well developed points with further mark for good example or expansion Can give extension of point if factor not quite right</p> <p>Accuracy and relevancy of the data</p> <ul style="list-style-type: none"> • The data used from the transaction systems that supply data to the management system must have passed a data validation and verification check. • Avoid information overload by not producing any data that is not needed as this can waste time and make the information harder to use. (Can't see the wood for the trees). <p>Flexibility of the system</p> <ul style="list-style-type: none"> • Managers of different sections have different requirements and the MIS must be able to cope with this. • Managers of different parts of the business such as marketing and finance have vastly different needs. • Allows individual project planning. • Managers can set up their queries own quickly <p>Accessible to a wide range of users / Different expertise</p> <ul style="list-style-type: none"> • Can be used by managers who have a range of ICT skills and knowledge. <p>Give information when required/needed</p> <ul style="list-style-type: none"> • Timing is critical as there is no point in giving good information after the date it is needed for. (implication of deadline). <p>NOT being able to present the data in the most appropriate form</p>	4x2

Q.	Section A Mark Scheme	Mark
8.	<p>1 mark for issue and 1 mark for extension x3 A number of points could be awarded in more than one category BUT only award each extension once</p> <p>Security issues A piece of software has bugs in it which allows outside agencies (hackers) access to the system (1) A new virus threat/hacker threat means that the software will need to be adapted to protect against this (1)</p> <p>Changes in the business environment Software may need altering so that it is more flexible in supplying the managers with information which was not envisaged at the time of development (1). Changes to values such as the percentage rate of VAT or changes to income tax rates will result in changes to the software (1). The organisation expands so the software needs to be altered so it is able to cope with an increased number of users (1).</p> <p>Dissatisfaction with hardware and software/ identifying errors in the system Staff are not happy with the speed of the system (1) A new operating system has become available (outdated software) (1) Staff feel that the hardware is very dated (1) Programs crash when used with certain other programs (1) Configuring the network management software to improve performance such as improving access times to data, speed at which reports are produced, etc. (1). Software may need to be modified to improve the user interface upon feedback from users who are finding it more difficult to use than it needs to be (1). Developing on-line tutorials and more help screens to help new staff learn the software (1). Lack of staff training to learn how to use the software (1) The software provider provides upgrades which will improve the performance of the software (1).</p> <p>NOT updating the system</p>	3x2

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9.	<p>(Item 1 mark and point 1 mark) x4 NB candidates can mix and match the problem answers but do not award duplicates but if no item cannot award point mark.</p> <table border="1" data-bbox="225 320 1331 1265"> <thead> <tr> <th data-bbox="225 320 778 371">Item</th> <th data-bbox="778 320 1331 371">Point</th> </tr> </thead> <tbody> <tr> <td data-bbox="225 371 778 524">Penalties /Consequences</td> <td data-bbox="778 371 1331 524">Verbal warning Written warning Dismissal Prosecution</td> </tr> <tr> <td data-bbox="225 524 778 707">Abiding by current legislation</td> <td data-bbox="778 524 1331 707">e.g. Data Protection Act, GDPR, Equal Opportunities Act, Computer Misuse Act, Copyright Act etc. - <i>don't sell confidential information about customers on to rivals</i></td> </tr> <tr> <td data-bbox="225 707 778 792">Authorisation and permissions on data access:</td> <td data-bbox="778 707 1331 792">What the employee can and can't do to data</td> </tr> <tr> <td data-bbox="225 792 778 909">Security of data</td> <td data-bbox="778 792 1331 909">Don't disclose passwords, personal use of email, logging on and off procedures, encryption of transferred data etc.</td> </tr> <tr> <td data-bbox="225 909 778 1025">Protecting hardware and software from malicious damage</td> <td data-bbox="778 909 1331 1025">By logging off workstation and locking doors/ not downloading viruses / not damaging them physically</td> </tr> <tr> <td data-bbox="225 1025 778 1111">Complying with licensing agreements</td> <td data-bbox="778 1025 1331 1111">Don't copy software onto home computers/ keep to correct No of copies</td> </tr> <tr> <td data-bbox="225 1111 778 1265">Personal Use</td> <td data-bbox="778 1111 1331 1265">Do not use equipment or software for personal use such as games playing, printing birthday invites, or personal email etc.</td> </tr> </tbody> </table>	Item	Point	Penalties /Consequences	Verbal warning Written warning Dismissal Prosecution	Abiding by current legislation	e.g. Data Protection Act, GDPR, Equal Opportunities Act, Computer Misuse Act, Copyright Act etc. - <i>don't sell confidential information about customers on to rivals</i>	Authorisation and permissions on data access:	What the employee can and can't do to data	Security of data	Don't disclose passwords, personal use of email, logging on and off procedures, encryption of transferred data etc.	Protecting hardware and software from malicious damage	By logging off workstation and locking doors/ not downloading viruses / not damaging them physically	Complying with licensing agreements	Don't copy software onto home computers/ keep to correct No of copies	Personal Use	Do not use equipment or software for personal use such as games playing, printing birthday invites, or personal email etc.	4x2
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NOT responsibilities or respecting the rights of others

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<p>Disinformation</p>	<p>Legal – Estate Agent putting false information in adverts.</p> <p><i>Estate Agent</i></p> <p>Legal requirements = Properties Act</p> <p><u>Hardware & software sales</u> Legal requirements = Trade Descriptions Act</p> <p>Writing false information on a web site</p>	<p>a property developer not telling his client the property has subsidence problems or a violent history</p> <p>Moral – not fully informing potential customers or clients of all available facts concerning products or services e.g. imminent introduction of new models</p> <p>salespersons selling hardware and software soon to become obsolete</p> <p>ensure salesmen do not pressurise unwilling customers to accept e.g. loyalty cards , instore credit accounts or particular brands</p> <p>Employees shall not misinterpret or selectively withhold information on capabilities of products, systems or services</p> <p>Employees must not persuade or give opinions on other products or services they have an interest in</p> <p>Employees shall complete work on time and to budget and shall advise their client as soon as practical if they cannot do so</p>	
<p>Privacy</p>	<p>Legal requirements = Data Protection Act / GDPR</p> <p>Informing data subjects of their legal rights and processes for complying with those rights.</p> <p>Selling on private information Don't access other people's files/No Hacking</p>	<p>Monitoring company emails. Electronic monitoring systems can be used to track emails. A systems technician might open other people's emails to detect misuse or simply to be nosey.</p> <p>an employee using company data to create mailing lists for his own private home business</p>	

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11.	<p>One mark for discussion of each factor and one for each further explanation/example saying how a company carries out each one x4</p> <table border="1" data-bbox="220 286 1329 1193"> <tr> <td data-bbox="220 286 775 439">Routines for distributing updated virus information and virus scanning procedures</td> <td data-bbox="775 286 1329 439">Ensuring virus signatures are updated daily and distributed around the network when a station logs in. Establish firewalls/ proxy-servers</td> </tr> <tr> <td data-bbox="220 439 775 555">Define procedures for use of removable media, personal backup procedures</td> <td data-bbox="775 439 1329 555">How often done, have they got to use special machines, etc encryption of data / memory stick</td> </tr> <tr> <td data-bbox="220 555 775 640">Establish security rights for updating web pages</td> <td data-bbox="775 555 1329 640">Who/what /when</td> </tr> <tr> <td data-bbox="220 640 775 792">Establish a disaster recovery programme</td> <td data-bbox="775 640 1329 792">Who does what and when, including checking the standby equipment Backup plans, i.e. how often NOT RISKS ANALYSIS</td> </tr> <tr> <td data-bbox="220 792 775 945">Set up auditing procedures (Audit trails) to detect misuse</td> <td data-bbox="775 792 1329 945">Who/what /when Contiguous investigation of irregularities Query any transaction out of the ordinary</td> </tr> <tr> <td data-bbox="220 945 775 1097">Logon on procedures / User id's and passwords / set up user accounts (expansion would be to do with rules for passwords)</td> <td data-bbox="775 945 1329 1097">Allocating access rights, etc Change regularly Don't write it down Use upper and lower case mix, etc</td> </tr> <tr> <td data-bbox="220 1097 775 1142">Call back procedures for remote access</td> <td data-bbox="775 1097 1329 1142">Who/what/when or why</td> </tr> <tr> <td data-bbox="220 1142 775 1193">Establish procedures for training staff</td> <td data-bbox="775 1142 1329 1193">Who/what/when or why</td> </tr> </table> <p>Accept any reasonable example or expansion such as who or what or when or how.</p> <p>Note: This topic is about <u>establishing procedures</u>. The question is all about the administrative procedures that organisations <u>can put in place</u> to minimise or prevent the threats, which is why we expect answers about updating virus checkers, etc, NOT running virus checks. NOT making sure backups are made, kept offsite, in fireproof boxes, etc, - It is <u>about planning a backup strategy</u> to avoid future problems. NOT establishing a code of conduct or screening potential employees</p>	Routines for distributing updated virus information and virus scanning procedures	Ensuring virus signatures are updated daily and distributed around the network when a station logs in. Establish firewalls/ proxy-servers	Define procedures for use of removable media, personal backup procedures	How often done, have they got to use special machines, etc encryption of data / memory stick	Establish security rights for updating web pages	Who/what /when	Establish a disaster recovery programme	Who does what and when, including checking the standby equipment Backup plans, i.e. how often NOT RISKS ANALYSIS	Set up auditing procedures (Audit trails) to detect misuse	Who/what /when Contiguous investigation of irregularities Query any transaction out of the ordinary	Logon on procedures / User id's and passwords / set up user accounts (expansion would be to do with rules for passwords)	Allocating access rights, etc Change regularly Don't write it down Use upper and lower case mix, etc	Call back procedures for remote access	Who/what/when or why	Establish procedures for training staff	Who/what/when or why	8
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Q.	Section A Mark Scheme	Mark										
12.	<p>2 out of the following covered (1 for method and 1 for extension)x2 Can get extension mark if method not there</p> <table border="1" data-bbox="220 286 1337 846"> <thead> <tr> <th data-bbox="220 286 499 338">METHOD</th> <th data-bbox="499 286 1337 338">EXTENSION</th> </tr> </thead> <tbody> <tr> <td data-bbox="220 338 499 456">Personal administration</td> <td data-bbox="499 338 1337 456">training (including prevention of accidental misuse) , fitting the employee to the task, ensuring that staff are controlled</td> </tr> <tr> <td data-bbox="220 456 499 539">Disciplinary procedures</td> <td data-bbox="499 456 1337 539">Warnings, sacking etc</td> </tr> <tr> <td data-bbox="220 539 499 725">System Access</td> <td data-bbox="499 539 1337 725">Proxy servers firewalls Levels of access (e.g. who can update web pages) Encryption User id and passwords</td> </tr> <tr> <td data-bbox="220 725 499 846">Continuous investigation of irregularities</td> <td data-bbox="499 725 1337 846">Looking for patterns/oddities in the access to the system to see if anything illegal is happening/ query any transactions that are out of the ordinary for customers</td> </tr> </tbody> </table>	METHOD	EXTENSION	Personal administration	training (including prevention of accidental misuse) , fitting the employee to the task, ensuring that staff are controlled	Disciplinary procedures	Warnings, sacking etc	System Access	Proxy servers firewalls Levels of access (e.g. who can update web pages) Encryption User id and passwords	Continuous investigation of irregularities	Looking for patterns/oddities in the access to the system to see if anything illegal is happening/ query any transactions that are out of the ordinary for customers	2x2
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NOT physical security or code of conduct or operational procedures

13.	<p>1 mark for each explanation</p> <p>Attribute -- a single item of data which represents a fact about an entity</p> <p>Entity – an object of the real world that is relevant to an ICT system e.g. a place, object, person, customer, product, etc</p>	<p>1</p> <p>1</p>
14.	<p>Any 2 points for each term</p> <p>Database management systems</p> <ul style="list-style-type: none"> • Allows the database to be defined • Allows the user to query the database • Allows data to be appended, deleted and edited/ Data storage retrieval and update (create ,edit and search) • Allows the user to modify the structure of the database • Provides security for the data held /Security - check passwords and access rights. • Allows the user to import and export data • Controls access to the data • Creation and maintenance of data dictionary • Managing facilities for sharing data e.g. when two people both simultaneously try to update the data (<i>Locking out other users</i>) • Backup and recovery of data • Allow applications to access the data and allow new applications <p>Query language Allows the user to extract specific information from the database (1) by permitting users to design their own queries (1)</p> <ul style="list-style-type: none"> • a data manipulation language used to perform searches sorts etc. / allows users to design their own searches / sorts • Queries combines into 1 table the data from several others • Selects fields which are to be shown in answer • Specifies criteria for searching or sorting • Save query so can be re-run • Saves answer table so it can be re-used in future reports <p>Data dictionary A central store of <u>information about the data</u> (properties) (1) such as tables, field names, field types, field length, validation used on the field, keys, relationships etc. (needs 3 of these for the second mark) (1)</p>	<p>2</p> <p>2</p> <p>2</p>
15.	<p>Any 2 of the following</p> <ul style="list-style-type: none"> • It allows greater <u>security</u> as not everyone has to see all the data (1) • It allows the designer of the database to <u>plan changes</u> without confusing the user (1) • It could stop the database from being <u>corrupted</u> if <u>too many people</u> could edit it. (1) 	2

16.	<p>Example of possible tables</p> <p>PATIENT (<u>Patientid</u>, surname, phone, DOB, allergies etc) APPOINTMENT (<u>AppointmentID</u>, Patientid#, DentistId#, Date, Time, Treatment)</p> <p>Underline = primary, # = foreign 1 mark per table name 1 mark per foreign key 1 mark per primary key 1 mark for 2 extra fields in each table (can be the same) If DentistId is duplicated then no mark for that key. NB No mark for a primary or foreign key which is not labelled</p>	7
17.	<p>Any 2 points for each</p> <p>Organisational structure. Office space requirements are reduced so need smaller premises with reductions in rents, rates, utility bills. /New premises may not be in original location causing problems with journeys to work. / Sometimes they are relocated to different cities which could lead to either loss of job or relocation expenses. E.g. some jobs may go abroad to call centres /breaking down friendship groups.</p> <p>Change in work patterns - split shifts or change of hours or night work, 24/7. Means that they are not able to work with the same people that they have worked with before / new hours might not fit in with their family commitments (1)</p> <p>Change in internal procedures - may make staff take on extra responsibilities for no extra money(1) staff who performed manual operations may have now to do other jobs which they feel incapable of doing (1)/ back room staff dealing face to face with customers (1) redundancies (1)</p>	3x2

18.	<p>2 marks for definition, 2 for advantages and 2 for disadvantages</p> <p>A distributed database is a single database that is under the control of a DBMS where the storage devices are not all attached to a common processor (1). Instead the data is stored in storage devices attached to multiple computers usually located across a network (1).</p> <p>Or</p> <p>A distributed database has data stored on a number of computers at different locations (1) but appears as one logical database (1).</p> <p>Advantages</p> <ul style="list-style-type: none"> • If data lost on central site it could be reduplicated from local site. • Allows sharing of the data and the results of processing the data. • New locations can be added to the database without the need for rewriting the entire database. • Faster response to user queries of the database. • Non-dependence on one central huge store of data. • Easy to backup and copy data from one server to another. • If one server fails then the other servers can be used. • Reduces network traffic as local queries can be performed using the data on the local server. <p>Disadvantages</p> <ul style="list-style-type: none"> • Software more complex than a centralised database system. • If data is transferred it presents more of a security risk from hackers. • As all the data is not stored in one location if a local site does not have adequate backup then this data might be lost to others. • If data is stored and updated in more than one place there is an increased chance of data inconsistency. • Heavy reliance on networks and communications which may not always be reliable. • Security risk increased as there are multiple access points • If one of the links to a server failed then the data could not be obtained from that server. • Increased costs owing to the use of expensive communication lines. NOT just costs. 	<p>2</p> <p>2</p> <p>2</p>
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19.	<p>1 mark for explanation involving: Large, Archive and used for Decision Making – Look for 2 of these 3</p> <p>A large collection of archived data used for decision making (1) OR A large company generates huge quantities of data stored in a consistent order to make interrogation more productive.(1) OR Data is non-volatile and time invariant (archive data).Used to support organisational decision making.(1) OR A huge database specifically structured for information access and reporting (1)</p> <p>Up to two marks for an example of use x2</p> <p>Examples for one mark (What or Why)</p> <p>Allows the company to store information about every sale. (1) Allows the company to see trends in buying (1) Allows the company to see who has bought what items and when. (1) Can use it to plan future changes or developments in their business. (1) Allows the company to use data mining. (1) example (1) Allows the company to find the most popular product. (1)</p> <p>Example for two marks (What and Why)</p> <p>Allows the company to see who has bought what items (1) and then target them with special offers. (1) (why)</p>	<p>1</p> <p>2x2</p>
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