



GCE MARKING SCHEME

INFORMATION AND COMMUNICATION TECHNOLOGY AS/Advanced

JANUARY 2014

INTRODUCTION

The marking schemes which follow were those used by WJEC for the January 2014 examination in GCE INFORMATION AND COMMUNICATION TECHNOLOGY. They were finalised after detailed discussion at examiners' conferences by all the examiners involved in the assessment. The conferences were held shortly after the papers were 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 conferences was to ensure that the marking schemes were 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' conferences, teachers may have different views on certain matters of detail or interpretation.

WJEC regrets that it cannot enter into any discussion or correspondence about these marking schemes.

	Page
IT1	1
IT3	11

**INFORMATION AND COMMUNICATION TECHNOLOGY
IT1**

Qu.	Answer	Marks	AO
1 (a)	<p>One mark per advantage (Max 2) from:</p> <ul style="list-style-type: none"> • Fewer transcription/typing errors or greater data consistency or easier to validate (what or a why). • Faster to enter/type in. • Processing is faster (because less RAM required) or faster to search/query (pattern matching). <p>NOT More data can appear on the screen NOT less space NOT storage space NOT faster to spot trends NOT anything connected to security. NOT less chance of getting RSI. NOT easier to query a database Encoding is not encryption. Do not accept just 'typing errors'.</p>	2	
1 (b)	<p>(Problem must match example to get two marks) Any one of the following, with an appropriate/sensible example. <i>Note - A well argued example could gain both marks.</i></p> <p>Problem Encoding can coarsen data Limited choice leading to less accurate data Limited choice leading to loss of precision Value judgement</p> <p>Example Not enough categories when representing eye colour, or age groups (when finding the mean have to assume all at the midpoint for grouped data) BUT NOT just answers like bracketing 34 year olds with 26 year olds causes problems. Value judgements fitting into a category and subjectivity / Value judgements can lead to inconsistency, e.g. hair colour, opinion on politicians, etc.</p> <p>Examples of one mark answers Coarsening data leading to loss of precision Limited Choice leading to less accurate data Value judgements can lead to inconsistency</p> <p>Examples of two mark answer Coarsening data can lead to loss of precision if dark brown, mousy brown, light brown are all classed as brown. Value judgements can lead to inconsistency for example if asked "Was the meal 'excellent', very good', 'good', or 'poor'?" One person's excellent meal is only good for another. NOT unable to understand the code or mixing up the code</p>	2x2	

2 (a)	<p>Any four from. (A description or an example is required. The candidate must name the characteristic).</p> <ul style="list-style-type: none"> • Correctly targeted - The question should be targeted at the people who are going to use it OR e.g. if asking for information about motorbikes there is no point asking car drivers. No good asking vegetarians about meat eating. • Understandable - The meaning of any information should be clear to the user OR if the information is in a very complicated format then it will waste time and people could draw the wrong conclusions from it. • Relevant - Data has to be related to the task you are trying to investigate. OR 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. • 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 i.e. 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. (Time has to be either stated or implied). (regularly/new) (Condone timely as an alternative word to up-to-date but not for list mark). <p>A plain list of three or four gets 1 mark.</p>	4	
2 (b)	<p>Only use time(1), human resources/people /staff /employees(1) and financial (1) cost once each (max 2) Must have a different stage with each cost. Two of the following stages with appropriate cost (1+1)</p> <p>Designing/Creating Data Collection sheets e.g. Pay someone to create the forms. Takes time to trial the sheets before using for real.</p> <p>Data Collection e.g. New staff have to be employed to go and ask people questions. Training needed to show the team how to collect the data.</p> <p>Data Entry New staff have to be employed to type in the results of the data collection. OMR devices have to be purchased. It takes time for someone to type in the data which takes them away from another job.</p> <p>Processing e.g. New software/hardware has to be written/purchased to allow the results to be obtained before the data gets out of date.</p> <p>Maintenance/Updating Staff have to be employed to keep the hardware running and to modify the software when legislation changes or bugs are found.</p>	2x2	
3 (a)	<p>Verification is a check: ensuring that data has been copied correctly from one medium to another (entered correctly). or to make sure data is consistent and has not been corrupted. or to stop data entry/copying errors</p>	1	

5	<p>3x (1 mark for each advantage and 1 mark for each example) Advantages – each point must be illustrated with a suitable example. Repetitive processing / carrying out the same task to the same standard repeatedly (consistency), e.g. Processing the payroll run on a computer for a large organisation. Data storage capacity / Able to store an enormous amount of information in a small space, e.g. all the information on the pupils in a large school will fit on a hard drive compared to a huge number of filing cabinets. Accuracy and context / Calculations are carried out accurately, e.g. in a spreadsheet if formula and data are correct then calculations will be correct. Speed of data communications / Messages sent out across the world instantaneously, e.g. an email can be sent from the UK to the USA within seconds. The ability to produce different output formats / Information can be produced in tabular or graphical format, 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.</p> <ul style="list-style-type: none"> • Ease of editing. NOT to do with handwriting. • Easier to back up data (Well qualified). • Allows predictive analysis / gives <i>better</i> management information. • Central storage (well qualified). 	3x2	
6 (a)	<p>1 mark for description of function and 1 mark for benefit This is when you give an entry/exit effect when you move from one slide to another e.g. such as fading. This could be used to keep the pupil interested / fun to watch help with the learning process / improves the flow of the presentation</p>	2	
6 (b)	<p>1 mark for description of function and 1 mark for benefit Are prewritten / master slides with design <u>and</u> some basic information already included eg school colours / logo / fonts (1) and it saves you having to create from scratch (qualified)(1) / This could be the corporate identity / making it look more professional (1)</p>	2	
6 (c)	<p>1 mark for description of function and 1 mark for benefit Bringing <u>in</u> information from another item of software or presentation. Saves having to retype the information such as exam results./ avoids copying errors / importing to have a better quality presentation (not twice)/ more interesting etc (not twice) NOT moving or 'in and out'</p>	2	
7 (a)	<p>Any 4 from</p> <ul style="list-style-type: none"> • 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 one big one. • Do not run out of stock /fast selling items. • Less risk of stock being out of date. • Easier to monitor staff performance. • Use of management statistics/monitoring stock levels is easier/ spotting trends. • Less staff needed to count stock. • Staff freed to do other jobs. 	4	

7 (b)	<p>1 for description and 1 per advantage</p> <p><u>Identifies the card holder as a member in a loyalty program.</u> <i>Accept different wording which implies <u>identification</u> of customer and <u>membership</u>.</i></p> <p>Allows the supermarket to find the shopping habits of customers and then allows them to target special offers.</p> <p>Keeps the customers coming back to the shop</p> <p>Allows customers to collect points from using the supermarket</p> <p>Gives the shop better statistics on trends.</p> <p>Improves planning as allows you to see what customers are buying and where they come from which helps decides location of new stores.</p> <p>Can sell the data on.</p>	<p>1</p> <p>1</p> <p>1</p>	
-------	---	----------------------------	--

8. **13-18 marks** Candidates give a clear, coherent answer fully and accurately describing four distinctly different developments giving advantages and disadvantages for each. They use appropriate terminology and accurate spelling, punctuation and grammar.
- 7-12 marks** Candidates give brief descriptions, some with advantages and disadvantages but responses lack clarity. There are a few errors in spelling, punctuation and grammar
- 1-6 marks** Candidates simply make brief points and may not give advantages and disadvantages. The response lacks clarity and there are significant errors in spelling, punctuation and grammar.
- 0 marks** No valid response.
- Answers have to cover 4 uses to get full marks.** (4 marks per use–non transferable + additional 2)

Use	Description	Advantage	Disadvantage
Mp3 player	Listen to 1000s of tracks on a small portable player Sensors can record distances run	Listen to favourite music wherever they are Record and plot progress	Lack of attention causes accidents Risk of expensive equipment being stolen Sound quality not as good
Music downloads	Allows you to select only the tracks you want	Saves money on buying whole albums	Copyright issues/illegal downloads
Music composition , Digital sound technology allows you to create edit and hear your own music.	Hardware Using instruments such as electronic keyboards with Midi interfaces Description of sound card technology Software Multi track sequencers Notation software Sound wave editing	Allows experimentation	Cost of purchasing equipment

Digital photography and movie making	Take many but only keep/ print out the ones you want	<p>Only pay/printout the better ones and saves money</p> <p>Only save the ones you want so saves memory</p> <p>Can digitally edit and enhance photos</p> <p>Variety of ways to display/distribute them e.g. online in e-books or on TV</p>	Cyber bullying issues e.g. digitally changing a photo to make someone look silly filming fights and uploading them
Interactive TV (Smart/3D)	Larger choice of channels and services such as teleshopping, email, book holidays	<p>On demand/anytime</p> <p>Parental controls</p>	<p>Closure of dvd shops</p> <p>Addiction</p> <p>Increased costs- monthly subscription etc</p> <p>Social isolation</p>
Social networking/blogging/twittering	<p>Free site</p> <p>Have to create accounts and email</p> <p>Have to accept advertising</p>	<p>Keep in touch</p> <p>Make views known/join debates</p> <p>Use in job applications</p> <p>Cheap way to advertise own services and companies</p>	<p>Identity theft</p> <p>Grooming</p> <p>Empowered rioters</p> <p>Potential employers seeing unsuitable photos</p> <p>Popups spreading viruses</p> <p>Pornographic material</p>
Games on a device	<p>Types of service</p> <p>Buy a disc or online gaming sites some of which some are free but others you have to pay a subscription.</p> <p>Hardware</p> <p>The speed of the processor is very important extra processing power in the form of graphics cards and sound cards to enhance their gaming performance.</p>	<p>Play people all over the world</p> <p>Enhanced 'real life' experience</p> <p>Team Building skills</p>	<p>Addiction</p> <p>Social isolation</p> <p>School work affected</p> <p>Incitement to violence</p>

<p>Mobile phones</p>	<p>Services available Text messages Voice mail Alarm clock/time Reminders/ to do list Change ring tone Record greeting message Display photos/ pictures on screen Radio TV Some can receive the Internet GPS/locator</p>	<p>Use anywhere there is a signal Can find location/map if lost</p>	<ul style="list-style-type: none"> • No service • No battery/ run out of credits • Fined if used when driving • Run up large phone bills <p>Risk of expensive equipment being stolen</p> <ul style="list-style-type: none"> • Potential radiation
<p>Illustrated use of Internet</p> <p>Online booking shopping/holidays/ Online betting/ Online dating (only one from above)</p> <p>Interactive telephony /videoconferencing</p> <p>Streaming of radio and video Podcasts</p>	<p>There must be an expansion for the second mark.</p>	<p>24/7 Easier for disabled Saves on travel time and costs</p> <p>Need not miss favourite programs Can access worldwide choice programs</p>	<p>Spreading a virus Hacking Online fraud/fake websites</p>
<p>Accept other valid uses Allow interpretation of home entertainment to include leisure activities which have a root in the home. e.g. digital photography where pictures are taken outside but images are manipulated at home, or joggers who use sensors to record physical activity and track progress on equipment at home.</p>			

9	<p>2 x (one mark for advantage in context and one mark for use.)</p> <p>Automatic recalculation (1) if data such as rate of pay changes (1) Can do what if calculations (1) on staffing or use of different materials/designs (1) Can draw graphs for reports (1) to highlight wages of different departments / compare monthly wage bill (1) Accurate calculation of wages/quotes (1) will increase efficiency/save time (1) Setting up templates (1) to work quotes out more quickly (1) Max 2 for 'no context' i.e. two from: ability to recalculate; can show graphically by producing various charts and graphs; accurate calculation, perform 'what ifs'. Accept other valid uses and advantages in context</p>	2x2	
10 (a)	<p>Two marks for each formula (2 from A and 1 from B) No mark for naming formula up to 2 marks for description of what it Does. Purpose plus extension or purpose plus detailed description of data used gains both marks. (What and why) A: SUM, COUNT, MAX, MIN, AVERAGE, RAND B: Single IF, Multiple IF, DATE, ROUND e.g. 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 I used the SUM function (SUM C2:C24) in column C of page 3 to add up all the costs of the different items sold every week (What) to work out my total income (Why). I used SINGLE IF in cell E14 on page 5 to work out if the account holders were overdrawn =IF (D2 <0, "ACCOUNT OVERDRAWN", "Account in credit") the message "ACCOUNT OVERDRAWN" appears and if the amount is not negative then the message "Account in credit" appears. I used the DATE function in cell F3 on page 2 to work out the difference in days between when the payment should have been made and when it was actually made so that interest could be charged on the outstanding balance. NB - NOW or TODAY are acceptable but must refer to a printed invoice otherwise the candidate could use DATE which is also acceptable. DATE function can reduce data entry errors Must be specific and related to work in their sheet.</p>	3x2	3 x AO2
10 (b)	<p>2x (one mark for stating method and field, and one mark for advantage) Has to be different for each, e.g. List boxes I used a list box in cell F4 on page 3 to select text from a pre-determined list (or their own example)(1) reducing data entry errors (1) increasing efficiency (1). Option or check boxes(Boolean choice) I used a check box in cell D4 on page 4 to click in the cell for yes/no data placing a tick in the cell (or their own example) (1) increasing efficiency by saving time (1). Spinners I used a spinner in cell G8 on page 6 using a button (or their own example) (1) to let you see how input changes will alter the outputs in a model (1) so you can see different outcomes more easily (1). NOT speed of entry. VLOOKUP and variations 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. (1) Faster to automatically enter data (1)</p>	2x2	

10 (c)(i)	<p>Two marks for description of a macro process. What and Why Must be a macro used in the candidates spreadsheet. e.g. My macro in cell F3 on page 2, is set to print the invoice (1) and defined the special print settings in the Page Setup dialog box and printed the invoice out quickly (1). Identify a navigation macro and where is it going to/between (page names) (1) this will make it more user friendly / to move backwards and forwards more efficiently (1)</p>	2	1 x AO2
10 (c) (ii)	<p>What and why I sorted the names of my customers on page 13 (1) 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)</p>	2	1 x AO2
10 (c) (iii)	<p>What and why I used a breakeven graph on page 12, in my profit loss graph,(1) this allowed me to find the number of items I had to sell before I was going to start making a profit. NOTE 'A visual representation of the data' is insufficient for the mark</p>	2	1 x AO2

**INFORMATION AND COMMUNICATION TECHNOLOGY
IT3**

1.	<p>Any 4 of the following well discussed 1 mark per factor - 1 mark per description or example (No Factor no mark for extension) If mistake in factor but good extension can gain extension mark. Note: explanations must be distinctly different and match the factor. An example can count as an extension. NOT the expertise of users NOT Consistent Layout NOT age</p> <p><u>Layout appropriate to the task</u> (There should be standard 'feel' to software) e.g. Uncluttered text for young children learning to read / large empty area for a designer using an architect to maximise the drawing area. <i>e.g. Large/minimal text for a child to minimise reading which builds up user confidence./ Bright colour scheme to attract a young child's attention.</i> <i>Doing a repetitive task such as entering holiday bookings means you have less guidance on the screen.</i> Note Nothing to do with devices</p> <p><u>Consistency of signposting and pop up information</u> e.g. Every 'Next' 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><u>Clear navigational structure</u> e.g. It speeds things up if there is a similar route through the programs (if it is clear) as users do not have to keep learning things / Helps users <u>learn</u> their way around the system. NOT LEARN TWICE if given in consistency above cannot award again</p> <p><u>Customisable to suit the needs of the user</u> 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</p> <p><u>Location of where machine is to be used</u> e.g. No sound in a noisy area. Touch screens in museums / factories / etc (with <u>explanation of why</u>).</p> <p><u>House Style/Ethos (Not Consistent Layout)</u> e.g. So that it conveys who the organisation is and all the company documents look/feel the same.</p> <p><u>On Screen / online helpfiles</u> (built in with software) e.g. Rather than wasting time 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 to take you through the task.</p> <p>No marks if can be read as a Google search</p> <p><u>Disabled Access</u> (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.</p> <p>CONDONE: Font size – (but not as a factor) readability, appropriate to level of user, avoid eye strain List of 4 = 1 mark</p>	4x2
----	---	-----

2.	<p>3 x (1 mark for giving each factor and a 2nd mark for a fuller description) Size of the organisation (NOT Size of the Network)</p> <ul style="list-style-type: none"> Needs can range from a small LAN to a global WAN. Some communications media are limited by the distance they have to travel. Amount of data processing required must also be considered. <p>NOT Need to be able to add more computers to the network. How the system will be used</p> <ul style="list-style-type: none"> What type of applications do users require? / Are the users going to require a wide range of applications? Will they need large data storage? / Are they going to store a large number of data files? From where will they operate the network e.g. at home in office or remote access from different locations. / Where does the processing get done? <p>Existing systems to integrate</p> <ul style="list-style-type: none"> More often networks are not developed from scratch but need to fit in with existing systems. Sometimes an extension is required e.g. when a new branch office opens. Therefore any new network must fit in with the existing operating systems and protocols. It must support any peripherals already in use e.g. bar code readers, printers, etc. Can the current stock of PC's and peripherals 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. <p>NOT just 'faster networks' <i>If candidates only list factors then maximum mark is 1</i> Condone security if reference to level of risk (value of data) NOT just hacking / viruses</p>	3x2
----	---	-----

3.	<p>Answers must mention both ring and star topologies making relative comments for each mark.</p> <p>Indicative content:</p> <p>These points could be made but must be related to each topology.</p> <p>ACCEPT THE OPPOSITE OF ANY OF THESE POINTS BUT NOT TWICE</p> <p>Advantages of ring</p> <ul style="list-style-type: none"> • Each computer has the same access as the others so no one computer can hog the network. • Higher transmission speeds / Data flows in one direction only (so large volumes can be transmitted). • <u>No collisions.</u> <p>Advantages of star</p> <ul style="list-style-type: none"> • <u>Fault tolerant</u> – if one of the cables fails, then the other computers can still be used.* • <u>Load tolerant</u> – extra computers can be added without much loss in performance because all computers have their own path to the server #. • Easy to add extra computers – extra computers can be added without disturbing the network. • Different speeds are possible on different spokes/ arms of the network. <p>Disadvantages of ring</p> <ul style="list-style-type: none"> • Faults are difficult to locate. • It is impossible to keep the network running whilst equipment is added or removed because there is only one path for the data to follow #. • Break in cable and network won't work*. <p>Disadvantages of star</p> <ul style="list-style-type: none"> • Higher cost – the large amount of cabling needed makes it more expensive. • Dependence on the central server/hub. <p>ACCEPT THE OPPOSITE OF ANY OF THESE POINTS BUT NOT TWICE i.e. an advantage of a ring can be a disadvantage of a star e.g. only give one of the two * or one of the two #</p> <p>N.B. Do not accept points which are really about <i>peer to peer</i> or <i>client server</i> networks</p>	6
4.	<p><i>1 mark for a brief explanation/example for each strategy</i></p> <p><i>1 mark for the benefit/advantage of the method</i></p> <p><i>1 mark for a drawback/limitation/disadvantage of the method x 2</i></p> <p>Direct changeover – stop using the old system one day and start using the new system the next day (1). Element of risk particularly if the hardware and software are cutting edge (1). If the system fails then it can be disastrous <u>to the business</u> (1). Requires fewer resources (people, money, equipment) and is simple, provided nothing goes wrong (1).</p> <p>Need more than easiest/quickest and not just cheapest</p> <p>Parallel changeover – Old ICT system is run alongside the new ICT system for a period of time until all the people involved with the new system are happy it is working correctly (1). Used to minimise the risk in introducing a new ICT system (1). Can compare results and be sure it is working properly (1)</p> <p>Disadvantages: lots of unnecessary work (as the work is being done twice) and is therefore expensive in people's time/work/equipment.</p> <p><i>Cannot give direct opposites as it is simple duplication but can give time in one and work or equipment in the other.</i></p>	2x3

5.	<p>Remote management is to do with stations not users One mark for each of any six points:</p> <ul style="list-style-type: none"> • Check on hardware to see what needs upgrading. • Setting regular times for virus scanning/ check virus scanning has been done. • Check to see right number of licences. • Guide users through problems / Control stations to demonstrate /solve /show. • Check to see no unauthorised software loaded on machines. • Log off users who have forgotten to do so. • Check on components to see if any failing. • Shut down stations. • Rebuild stations / re-setup stations / re-install/update <u>software</u>. • Send instant messages. • Clear printer queues (at stations). <p>NOT manage passwords / delete files / other tasks normally done at the server NOT restrict users internet access</p>	6
6.	<p>Allow sensible reverse answers but not duplicate points. Dialup:</p> <ul style="list-style-type: none"> • Modem/ dialup is very slow and limits its use - a download on dialup can take minutes compared to broadband. • If only a light user dialup might be cheaper as only have to pay when you are using it *. • Can be used anywhere there is a phone line #. <p>Broadband:</p> <ul style="list-style-type: none"> • Not available everywhere (blackspots) #. • You pay a monthly subscription so more expensive if light user/ whether you use it or not/ easier to budget / not penalised by heavy usage if have unlimited package*. • Streaming (fast download time) means that you can use it to listen or watch films or music / less need for buffering / less lag /greater bandwidth. • Faster download of information / faster downloading (only award this if there is no other mention of downloading). • It does not tie up your phone line. • More secure as it keeps anti-virus etc up to date automatically. • Can make cheap phone calls via the internet. • Makes video conferencing possible. • Don't have to waste time connecting to the internet / Always on. <p>Only give one of * or # answers Not 'Can be used anywhere there is a broadband connection'/ not wireless answers or teleworking Not multiple devices</p>	6

7.	<p>(1 mark for statement of change and 1 mark for explanation of why) 3 x 2</p> <ul style="list-style-type: none"> • <u>Fears of redundancy</u> with lost jobs. Less staff are often needed to do the same amount of work once computers are introduced. / New system may replace staff who performed manual processes e.g. filing, etc. • <u>Change in work patterns</u> - split shifts or change of hours or night work, 24/7. • <u>Fear of reduction in status and job satisfaction</u>. Management Information systems means less middle managers are needed so departmental heads may lose power./ Data warehousing means all data is stored centrally and is available to all some departments who used to be asked for the information are downgraded in status. • <u>Change in internal procedures</u> - may make staff take on extra responsibilities for no extra money. • <u>Fear of Retraining/Fear of looking ridiculous</u>. Established staff members may feel their lack of ICT skill and knowledge may make them look incompetent. • <u>Changes in location/Organisational structure</u>. 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. • <u>Fear of Health risks</u> from working with computers, back problems etc. 	3x2
----	---	-----

8.	<p>1 mark for brief description of the factor and 1 mark for further explanation or an example x 2</p> <ul style="list-style-type: none"> • <u>Appropriate training/retraining</u> – to ensure all staff understand the new system and wondering what to do. • <u>Explanation of the advantages</u> – so that staff can see how they will benefit by making the job easier/ more interesting / answer any queries. • <u>Spell out the implications of the new system (meetings)</u>– to help stop rumours which give people stress / allow staff to express worries. • <u>Opportunity to learn new skills</u> – enable staff to improve their job prospects. • <u>Involvement in the development of the new system</u> – so that the staff can have a system which is straightforward to use. • <u>Keeping social groups together / not disrupt working relationships</u> – less stress / work together as a team. <p><i>Any sensible extension</i></p>	4
9.	<p>Look for four well developed points with further mark for good example or expansion</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>Providing data/information in an appropriate form (table/graph) (CONDONE format as long as it is clearly not formatting text)</p> <ul style="list-style-type: none"> • Managers will need the data presented in the easiest form for them to interpret, some will want it in tabular form and some in graphical. <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</p> <ul style="list-style-type: none"> • Timing is <u>critical</u> as there is no point in giving good information after the date it is needed for. (implication of deadline). 	4x2

10.	<p>Must have at least one advantage and one disadvantage to get full marks</p> <p>Advantages</p> <ul style="list-style-type: none"> • Can access e-mail, surf the internet from wherever you are (on the move). • Can work more productively because you can do things at once, without having to go back to the office. • Can easily modify your plans – flights, trains, hotels. • Increase in real time collaborative working / voice conferencing / video conferencing. • Can work anywhere in the <u>home or office</u> (teleworking) (or concrete example). <p>Disadvantages</p> <ul style="list-style-type: none"> • Affects home / work balance. • Can be very expensive if use a mobile phone for the access. • Many black spots / poor connectivity. • Increased security problems from hacking. • Battery life on mobile devices. • Network overload at peak demand. • Some attachments cannot be opened / worked on. • Work progress hampered by distractions. <p>NOT loss of device through leaving on a train, etc NOT saving travel costs</p>	4
11.	<p>Any four of the following, discussed in suitable detail:</p> <ul style="list-style-type: none"> • Maintaining a company website / need for trained staff. • Catalogue of stock/products, stock database/table so that one can immediately see if something is available or whether there will be a delay. • Methods of secure payment / shopping trolley. • Database/table of customer orders/bids so that immediate searches can be made to find and update customer information. • Order/bid tracking / email confirmation. <p><i>If candidate just states four points then maximum mark is 1</i></p>	4

12.	<p>6-8 marks Candidates give a clear, coherent answer fully and accurately discussing the advantages and disadvantages for both company and customer. They use appropriate terminology and accurate spelling, punctuation and grammar.</p> <p>3-5 marks Candidates briefly discuss some advantages and disadvantages for both company and customer, but responses lack clarity. There are a few errors in spelling, punctuation and grammar.</p> <p>1-2 marks Candidates simply list a few factors or give a brief description of one and may not relate to company or customer. The response lacks clarity and there are significant errors in spelling, punctuation and grammar.</p> <p>0 marks No appropriate response.</p> <p>Evaluation of any valid point one mark (max 8). Very well argued point could be worth two.</p> <p>To get full marks must have at least one advantage and one disadvantage</p> <p>NB Context must be e-commerce business.</p> <p>Do not give duplicates (see * and # below)</p> <p>Advantages to customers</p> <ul style="list-style-type: none"> • It enables people to find out what they do and what they sell. / searches. • There is no travelling – it can be done from home so saving in costs and time delivered to the door. • Allows disabled people to do more shopping. • Can be done 24/7*. • Can find obscure goods not available locally. • Much quicker to do a price comparison. • See other customer reviews. • Order tracking. • Better deals available online / much quicker to do price comparisons / find cheaper deals online. • Avoid wasting time in queues (must be qualified) e.g. at peak/sales time. <p>Advantages to company</p> <ul style="list-style-type: none"> • People can email them with enquiries, orders, requests.. • Technology has advanced and now made a lot more possible. • Overheads cut / Large savings on shop, warehouse and office space / Less money tied up in stock / less stock wastage. • Wider customer base / Can reach an international audience. • More efficient customer targeting. • Can target sales because you can see rivals prices on their website and alter your prices#. • Can sell 24/7 (but not if given as an advantage for customers)*. <p>Disadvantages</p> <ul style="list-style-type: none"> • Credit card fraud. • Fake websites - goods do not exist. • Copycat websites to extract bank account info. • Fewer shops on the High Street NOT less staff needed. • Lack of social interaction. • Increase in delivery vans (but please note do not accept having to rely on delivery companies or any issues with delivery lorries other than <u>environmental ones</u>). • Cost of maintaining a company website / need to maintain more secure network. • Need for trained staff. • Can't fully assess the quality of the goods / can't try it on. • Competitors can see your prices and target your company#. • Hidden charges (if qualified) e.g. import duty on goods being bought from abroad. <p>Other effects</p> <ul style="list-style-type: none"> • Security issues e.g. hackers stealing bank account details <p>NOT problem with sending goods back NOT problems with delivery companies NOT lose/have no internet connection</p>	8
-----	--	---

13.	<p>Suitable definition of data normalisation, such as: A staged (mathematical) process (1) which removes repeated groups of data and inconsistencies. (1) Or Simplifying data structures (1) so that attributes in each table only relate to the entity. (1) Or Normalisation is the organisation of data into tables (1) which relate to a single entity. (1) Marks can be gained by using an example of the process of going from first to third form. Do NOT accept advantages of databases</p>	2
14.	<p>Hierarchy of passwords -- passwords to see separate parts NOT just passwords Storage of data separate to programs Access rights to parts of the program. NOT 'cannot delete linked tables'</p>	3
15.	<p>2 marks for definition and 5 for advantages / disadvantages 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). Or A distributed database has data stored on a number of computers at different locations (1) but appears as one logical database (1). 1 mark each for any four points but must have at least one advantage and one disadvantage 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 issues particularly if sensitive personal data is being transferred. • 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. 	7

16.	<p>1 mark for explanation involving: <u>Large, Archive</u> and used for <u>Decision Making</u> – Look for 2 of these 3 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 Examples for one mark (What or Why) Allows the company to store information about every sale. (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) Allows the company to find the most popular product. (1)</p> <p>Example for two marks (What and Why) Allows the company to see who has bought what items (1) and then target them with special offers. (1) (<i>why</i>)</p>	3
17.	<p>One mark for the meaning (patterns / trends / generating new information) Data mining is interrogating the data to find patterns in the data which is stored in the warehouse.</p> <p>Alternative wording for above might be:</p> <ul style="list-style-type: none"> • Is the analysis of a large amount of data in a data warehouse to provide new information? • Is a speculative process investigating potential patterns? • Involves the presumption that dormant within the data are undiscovered patterns / groupings / sequences / associations. • Software uses complex algorithms to search for patterns. • Is drilling down into the mass of data so users can understand it more / discover meaningful patterns. • Is looking for meaningful patterns in a large mass of data and presenting results in tables and graphs. <p>Up to two marks for example of use Examples worth 1 mark:</p> <p>Can provide:</p> <ul style="list-style-type: none"> • The company with a list of customers likely to buy a certain product, which they can then use to target with a mail shot. • Comparisons with competitors. • Useful ‘what if’ results from modelling exercises. • Predictions for future sales. • Analysis of best sites for shops. • Analysis of sales patterns. • Returned information can be tested for plausibility. • Data if of value can be processed into a report to help decision making. 	3

17 Cont	<p>Examples worth 2 marks: (What and Why)</p> <ul style="list-style-type: none"> • Fighting shoplifting in clothing stores – Jaeger used DM to look at transactions and position of item in store (1) – found even with tags most items stolen near doors – led to increased CCTV, more prosecutions and recovery of goods.(1) • Analyse buying patterns / Identification of customer needs – Virgin Media use DM to segment and target customers (1) most likely to buy new services or upgrades. (1) • Could allow company to find a previously unknown relationship between regions of the country and food preferences (1) and they can then target special promotions. (1) <p>The difference here is that the why will refer to a <i>new connection</i> between the data or a new conclusion</p>																									
18.	<p>One mark explanation per relevant point, up to nine: Answers must be sentences and not a list. Consequences must match threats. List of consequences 1 mark. List of threats 1 mark. Note: Hacking and viruses are not a threat in themselves. Inserting a virus to deliberately destroy data is sabotage. Hacking to take data is theft. Must have four different consequences.</p> <table border="1" data-bbox="284 949 1278 1955"> <thead> <tr> <th data-bbox="284 949 576 1055">Threat</th> <th data-bbox="576 949 954 1055">Example</th> <th data-bbox="954 949 1278 1055">Consequence (could be interchangeable)</th> </tr> </thead> <tbody> <tr> <td data-bbox="284 1055 576 1189">Terrorism</td> <td data-bbox="576 1055 954 1189">Cyber attacks to slow down or prevent online services</td> <td data-bbox="954 1055 1278 1189">Loss of reputation</td> </tr> <tr> <td data-bbox="284 1189 576 1391">Criminal vandalism/sabotage</td> <td data-bbox="576 1189 954 1391">Attacks on firewalls by viruses to destroy data Deliberate destruction of the physical data</td> <td data-bbox="954 1189 1278 1391">Loss of business and income</td> </tr> <tr> <td data-bbox="284 1391 576 1659">Theft by Hacker/employee (White collar crime)</td> <td data-bbox="576 1391 954 1659">Hacking into data to steal company private details Or copying company records onto disc and selling it to rivals / and misuse it for own purpose</td> <td data-bbox="954 1391 1278 1659">Legal action</td> </tr> <tr> <td data-bbox="284 1659 576 1727">Natural disasters</td> <td data-bbox="576 1659 954 1727">Floods, earthquakes</td> <td data-bbox="954 1659 1278 1727">Costs of recovering data</td> </tr> <tr> <td data-bbox="284 1727 576 1832">Accidental altering of data</td> <td data-bbox="576 1727 954 1832">Overwriting files: accidental deletion of files</td> <td data-bbox="954 1727 1278 1832"></td> </tr> <tr> <td data-bbox="284 1832 576 1899">Theft of data</td> <td data-bbox="576 1832 954 1899">Stealing storage media containing data</td> <td data-bbox="954 1832 1278 1899">Legal action</td> </tr> <tr> <td data-bbox="284 1899 576 1955">Fire</td> <td data-bbox="576 1899 954 1955">Electrical fire in building</td> <td data-bbox="954 1899 1278 1955">Loss of business and income</td> </tr> </tbody> </table>	Threat	Example	Consequence (could be interchangeable)	Terrorism	Cyber attacks to slow down or prevent online services	Loss of reputation	Criminal vandalism/sabotage	Attacks on firewalls by viruses to destroy data Deliberate destruction of the physical data	Loss of business and income	Theft by Hacker/employee (White collar crime)	Hacking into data to steal company private details Or copying company records onto disc and selling it to rivals / and misuse it for own purpose	Legal action	Natural disasters	Floods, earthquakes	Costs of recovering data	Accidental altering of data	Overwriting files: accidental deletion of files		Theft of data	Stealing storage media containing data	Legal action	Fire	Electrical fire in building	Loss of business and income	4x3
Threat	Example	Consequence (could be interchangeable)																								
Terrorism	Cyber attacks to slow down or prevent online services	Loss of reputation																								
Criminal vandalism/sabotage	Attacks on firewalls by viruses to destroy data Deliberate destruction of the physical data	Loss of business and income																								
Theft by Hacker/employee (White collar crime)	Hacking into data to steal company private details Or copying company records onto disc and selling it to rivals / and misuse it for own purpose	Legal action																								
Natural disasters	Floods, earthquakes	Costs of recovering data																								
Accidental altering of data	Overwriting files: accidental deletion of files																									
Theft of data	Stealing storage media containing data	Legal action																								
Fire	Electrical fire in building	Loss of business and income																								

19.	<p>One mark for discussion of each factor and one for each further explanation/example saying how a company carries out each one</p> <table border="1"> <tr> <td>Screening potential employees</td> <td>Ensure staff are controlled Fit employee to the task CRB checks</td> </tr> <tr> <td>Routines for distributing updated virus information and virus scanning procedures</td> <td>Ensuring virus signatures are <u>updated</u> daily and distributed around the network when a station logs in Establish firewalls</td> </tr> <tr> <td>Define procedures for downloading from the internet, use of removable media, personal backup procedures</td> <td>Staff code of conduct Penalties for misuse How often done, have they got to use special machines, off site etc</td> </tr> <tr> <td>Establish security rights for updating web pages</td> <td>Who/what/when</td> </tr> <tr> <td>Establish a disaster recovery programme</td> <td>Who does what and when, including checking the standby equipment Backup plans, i.e. how often NOT RISKS ANALYSIS</td> </tr> <tr> <td>Set up auditing procedures (Audit trails) to detect misuse</td> <td>Who/what when Contiguous investigation of regularities Query any transaction out of the ordinary</td> </tr> <tr> <td>Logon procedures / User id's and passwords</td> <td>Allocating access rights, etc Change regularly Don't write it down Use upper and lower case mix, etc</td> </tr> <tr> <td>Call Back procedures for remote access</td> <td>Who/what/when/why</td> </tr> <tr> <td>Establish procedures for training staff</td> <td>Who/what/when</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 establishing procedures. The question is all about the administrative procedures that organisations can put in place 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 about planning a backup strategy to avoid future problems.</p>	Screening potential employees	Ensure staff are controlled Fit employee to the task CRB checks	Routines for distributing updated virus information and virus scanning procedures	Ensuring virus signatures are <u>updated</u> daily and distributed around the network when a station logs in Establish firewalls	Define procedures for downloading from the internet, use of removable media, personal backup procedures	Staff code of conduct Penalties for misuse How often done, have they got to use special machines, off site etc	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 regularities Query any transaction out of the ordinary	Logon procedures / User id's and 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/why	Establish procedures for training staff	Who/what/when	6
Screening potential employees	Ensure staff are controlled Fit employee to the task CRB checks																			
Routines for distributing updated virus information and virus scanning procedures	Ensuring virus signatures are <u>updated</u> daily and distributed around the network when a station logs in Establish firewalls																			
Define procedures for downloading from the internet, use of removable media, personal backup procedures	Staff code of conduct Penalties for misuse How often done, have they got to use special machines, off site etc																			
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 regularities Query any transaction out of the ordinary																			
Logon procedures / User id's and 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/why																			
Establish procedures for training staff	Who/what/when																			



WJEC
245 Western Avenue
Cardiff CF5 2YX
Tel No 029 2026 5000
Fax 029 2057 5994
E-mail: exams@wjec.co.uk
website: www.wjec.co.uk