GCE MARKING SCHEME

INFORMATION & COMMUNICATIONS
TECHNOLOGY (NEW)
AS/Advanced

JANUARY 2010

INTRODUCTION

The marking schemes which follow were those used by WJEC for the January 2010 examination in GCE INFORMATION & COMMUNICATIONS TECHNOLOGY (NEW). 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.

1(a)	**One mark per answer** Reduces the amount of hard disk space / less memory required - **NOT** less space Lessens the chance of entry errors / easier to validate / greater consistency. Faster to search. **NOT** Easier to code data than to type the whole word. **NOT** anything connected to security.	2
1(b)	**Any two from:** (problem must match example to get 2 marks) Encoding can coarsen data and the loss of precision must be weighed against its advantages, e.g. Hair colour survey light brown, mousey, dark brown would all be classified as brown because all the categories are not present. Could gain 2 marks for an example with a conclusion e.g. Hair colour survey light brown, mousey, dark brown would all be classified as brown because all the categories are not present giving misleading results. Subjective judgements e.g. someone may be asked was that meal 'Excellent', 'Very Good', 'Good', or 'Poor'. One person's excellent meal is only a good meal for another. **Encoding is not encryption.**	2 x 2

2(a)	**1 mark for each distinct point up to max 2.**
	2 marks for each of two extended points or suitable different examples, e.g.
	Schools get funded on the number of pupils according to year, location, SEN, etc, if out of date or inaccurate information they will get the wrong funding.
	If contact details are out of date then letters to parents might not get to them / might need to contact parents in an emergency and will not be able to.
	Pupil's medical problems / personal situations might change and school needs the latest information to be able to deal with it properly.
	Could give a false picture of the whole national school population if information is not kept up-to-date.
	Extension needed to gain second mark:
	    Comply with DPA.
	    Headteacher / Governors responsibility.
	    Medical emergencies.
		2x2

2(b)	**Any two from:** (Cost must match example to get 2 marks and examples must relate to context and differ) **Financial**: Cost of posting letters to parents on an annual basis to check whether their data is correct. **Time:** Time taken to enter data / time taken to check data on the system with the SEN register or LEA free school meals lists, etc. **Human**: Extra staff needed to enter the data / collect the returns from parents, etc. Staff training could be an example for all three – **Accept only once**.	2 x 2
3.	**Any three from:** **Accurate**: error free and a true reflection of what it represents. **Correctly targeted**: information should be presented to the people who need it. **Understandable**: the level of detail and language used should reflect the user. **Complete**: information should include all the data needed to make a decision. **Relevant / fit for purpose**: information should not be included if it has no bearing on the user's needs. **NB** a plain list from the above just gets 1 mark. Also accept: **Timely** (must be different from up to date**)** **Reliable** (if refers to source).	3

4(a)	**Definition 1 mark, name of method 1 mark, description 1 mark.**
	 Validation is the automatic checking of data entered into a computer system.
	 or
	 Validation is the checking that the information is sensible/reasonable/legal (**BUT** not valid).
	 e.g. Check digit on account number
	        Range check on date of birth / amount allowed to be transferred
	        Presence check on certain (specified) field.
	 Example must be sensible and relevant to online banking.
		3

4(b)	**Definition 1 mark, name of method 1 mark, description 1 mark**
	 Verification is the use of checks to make sure data is consistent and has not been corrupted.
	 or
	 Verification is the checking that data has been copied accurately from one medium to another (entered correctly but data might not itself be correct).
	    Proof reading – being asked to check what you have entered is correct before being allowed to move on. (Read before you submit).
	    Double entry – having to re-input your account number, email address or the password.
	 Example must be sensible and relevant to online banking.
		3

5	**3 x (1 mark for advantage, 1 mark for context/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. **Speed of processing:** carrying out many complex computer calculations in a relatively short time interval, e.g. it would be impossible to produce accurate weather forecasts for the next five days without a powerful computer / credit card transactions. **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. **Speed of searching:** Able to find information quickly, e.g. a police check will find information on a particular car almost instantly. **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. **Ease of editing:** **NOT** to do with handwriting.	3 x 2

6(a)	Stored master document with a <u>predefined layout</u> (or implication) which can be used as a basis for other documents, e.g.
	    pre-defined letter for sending information to beneficiaries.
	    Wills / Tenancy agreements / Contracts / other documents related to solicitors.
	    Condone Letter headed notepaper.
		2

6(b)	**Either** Storing a sequence of keystrokes and menu choices which can be repeated by running the macro **or** A small program to perform a repetitive task and which can be created and stored for later use by a user. e.g. could be used to call up a particular contract template and move the cursor automatically to where data has to be entered.	2
6(c)	Takes data automatically from a <u>data source</u> and <u>puts it into</u> an outline <u>document</u>. Must have all 3 stages. e.g. sending a letter to all clients telling them of a change of fees or partner or advertising 'Write a will' week.	2

7(a)	**Any three from:** Better monitoring of what all staff are using their systems for by being able to centrally audit all transactions simply. Easier to backup data by being able to do it from one central location. Greater security by having one program controlling all computer access. Having a central pool of data/documents which all staff can access. Staff can work jointly on the same document at the same time. Easier and quicker to install software as it can be done centrally and then shared out to all stations without physically going to each one. Getting data from another hard drive/server. **Condone** description involving remote access / vpn / remote management **NOT** just shared data or access their work on any computer.	3
7(b)	To get full marks candidates need to have at least one of each. NB to the organisation and not the individual. **Advantages:** It is cheaper to send an email than to use the telephone or to send a document by normal post. Can send the same email to a group of people as easily and as cheaply as sending one email. Can use an address book of contacts to allow you to quickly send a message without having to retype the address. Attachments can be sent which can be worked upon and then sent back. Faster to send to other regions of the world. You can get a message saying that the email has been read. Gives you an accurate transcript of what has gone on. Ease of forwarding. **NOT** just faster to send or receive. **Disadvantages:** Does not allow a two-way conversation as a telephone does and leads to lack of social interaction. Too easy for people to waste time dealing with personal emails rather than work. Too many emails are sent which are wasting a lot of employee time. Physical items cannot be sent. Can introduce viruses into the system. Cyber bullying / inappropriate content. Work/life balance. Organisation has to pay for internet access. Spam / Phishing. Condone Might not have the software to open it.	4

8(a)	**5-7 marks**	Candidates give a clear, coherent answer stating the three main components and fully and accurately describing, with examples the advantages and disadvantages of their use. They use appropriate terminology and accurate spelling, punctuation and grammar.	7
	3-4 marks	Candidates state the three main components and describe some advantages and disadvantages using some examples but responses lack clarity. There are a few errors in spelling, punctuation and grammar.	
	1-2 marks	Candidates make brief points and may give an advantage, disadvantage or example. The response lacks clarity and there are significant errors in spelling, punctuation and grammar.	
	0 marks	No valid response.	

Indicative content
Answers have to cover all 3 components and there has to be at least one advantage, disadvantage and example to get full marks.

Main components
 Knowledge base
 Inference engine
 User Interface
Advantages
 Cheaper to update than to train doctors.
 Always available 24 hours a day
 Will never retire - No loss of expertise.
 Can be made available to people in remote areas with no access to human expert.
 Some people prefer talking to a computer.
 Give the doctor more time to deal with other patients.
 Can provide a second opinion.
 Can store far more information than a human.
 Does not forget or make human errors.
 Training using simulators.
 Using NHS direct allows self diagnosis.
Disadvantages
 Lack of personal contact.
 Dependent on the correct information being stored i.e. wrong rules wrong diagnosis
 Incorrect data entered could cause an incorrect dosage of a drug which a human might spot.
 Over-reliance on the system which could cause problems in a power failure, etc.

8(b)	**8-11 marks**	Candidates give a clear, coherent answer fully discussing the uses with examples, advantages and disadvantages. They use appropriate terminology and accurate spelling, punctuation and grammar.	11
	4-7 marks	Candidates make some points with examples, advantages and disadvantages but responses lack clarity. There are a few errors in spelling, punctuation and grammar	
	1-3 marks	Candidates simply make brief comments but may not give examples, advantages or disadvantages. The response lacks clarity and there are significant errors in spelling, punctuation and grammar.	
	0 marks	No valid response.	

Indicative content
To get full marks points must be made on body scanning, blood tracking, sensors in patient care (not doors) with examples, advantages and disadvantages.

MRI: provide a tremendous level of detail on tissue information, i.e. very good for detecting brain tumours.
CAT: produces a complete 3D model of a patient's bones and internal organs.
Advantages
Produce accurate diagnosis without the need for surgery
leads to faster recovery
removes the danger of post operative infections.
Disadvantages
Expensive to purchase and to run
Can be claustrophobic
Could result in the loss of traditional diagnostic skills
Have to keep still for long periods in MRI
Health risks – increased risk of cancer
Pacemakers and metallic limbs cannot go through scanners
Need for expert training / interpretation
Postcode lottery.

Blood bar coding allows the tracking of blood from its donation to its use.
Patients have a bracelet with a barcode which is matched with bar code on the blood bag / donor.
Can track a patient / donor if given bad blood (CJD, hepatitis, cross contamination).
Better stock control of the blood.
Makes sure patient gets the right type.

Sensors used in ITU units such as temperature, blood pressure, central venous pressure, etc, (no more than 2).
Allows 24/7 monitoring. Alarms sounding. Frees up staff.
Accurate reading / recording.
New born babies and wristbands to prevent being taken from the ward.
Calibration needed to check accuracy.
Other examples include:
    Robotic surgery
    Cochlear implants
    Laser eye surgery
    Intelligent pills
    Bionic limbs

9	**1 mark for definition (to get other 3 marks must have at least 1 advantage and 1 disadvantage)** Simulation modelling means using a computer and mathematical formulas to imitate a real phenomenon. (they look at what if scenarios) **Advantages** Enables predictions to be made in areas which may be dangerous to humans. It is usually much cheaper as do not have to crash planes or cars. Some situations cannot be performed in real life for testing purposes - a 10% price hike, making a nuclear reactor go critical. Easier to study long term affects by speeding up time scale or by slowing down. **Disadvantages** Prediction only as accurate as the rules or data entered. Powerful expensive computer hardware needed to run the simulations. Some things, such as earthquakes, are hard to predict accurately and so hard to simulate.	4
	Before starting to mark question 10 look through the spreadsheet printouts to determine how the candidate has identified pages and screenshots. In reading each answer to questions 10 (a), 10 (b), 10 (c) and 10 (d) look for the page or printout indicated. If you cannot see the item, look at the page (printout) before and after the one indicated. If you cannot see the item then no mark can be awarded.	
10(a)	2 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.* A: SUM, COUNT, MAX, MIN, AVERAGE, RAND B: 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) 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) **Must be specific and related to work in their sheet.**	6
10(b)	Can be seen on page 13 cell D6 and F9 in the table on page 14. I enter the name of an item and the price is then found from the information I have already put in the prices sheet. (1) **Advantage** (1) reducing data entry errors increasing efficiency supported by a suitable example If a price changes you only have to change it in the reference table Speed of data entry **Disadvantage** (1) If the item changes value then I will have to go and change the price sheet as well Complexity (explained) If you rename or move the table it will not work. Data has to be sorted into order. If there are errors in the look up table there will be errors in the result. **HAVE TO SHOW WHERE THE FUNCTION IS USED TO GAIN ANY MARKS**	3

10(c)	**One mark for naming a validation technique. Up to 2 marks for detailed description.**	3
	e.g. I put a range check (1) of between 1 and 9999 (1) on my customer order number (1) to ensure numbers were within the correct range (1), (any of these other points are worth a mark).	
	I used conditional formatting (1) by putting a preset formula (1) e.g. to work out the date (1) for data in another cell (1).	
	I set the text length to 10 characters to put a limit (1) on customer Postcode (1) to prevent incorrect data being entered. (1) (Max 2 for this answer as length check not named.)	
	Can accept a customised error message.	
	HAVE TO SHOW WHERE THE FUNCTION IS USED TO GAIN ANY MARKS	
10(d)	**Any 2 from:** I used filter 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)	2 x2
	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.	
	I used a breakeven graph on page 12, this allowed me to find the number of items I had to sell before I was going to start making a profit.	
	I used a drop down list on page 2 which displayed the three dimensions of each type of bathroom. Its purpose was to reduce errors.	
	HAVE TO SHOW WHERE THE FUNCTIONS ARE USED TO GAIN ANY MARKS	
	Total	**80**

1(a)	The novice user's priority will be ease of learning/intuitive (1) and easy access to help (1). The expert user will want to get the job done in the least possible time (1). Novice user will need clear navigation structure (1). Novice user will use wizards which are not as flexible as setting it out yourself (1). Expert user knows the commands (1) and will find it quicker than clicking through a series of windows (1) (dos window to use ipconfig compared to getting the same info from windows (1)) Increased number of ways of performing the same operation (1). Shortcuts which the experienced user can use rather than going through a series of menus (1). Colour scheme making it easier to use (1) *If candidates make four or more valid points but do not differentiate between users then Max 2.* Condone well argued points made about specific application.	5
1(b)	**One mark for each point to a maximum of 4 marks.** Use of speech recognition rather than keyboards for users who cannot use keyboard or mouse (1). Use of specialist input devices such as those which use blow pipes or eye movements (1) Ability to magnify areas of the screen to aid users with bad eyesight (1). Ability to increase the font size to aid users with poor eyesight (1). Use of correct colour schemes to help people who are colour blind / dyslexia (1). Illustrated use of Braille device (1). Illustrated use of text to speech output (1). Use visual messages rather than beeps or warning noises for users who are deaf (1). Use of a large mouse for people with poor coordination (1). Use plenty of contrast between the text and the background to aid people with poor eyesight (1). Condone example of not using frames or patterned backgrounds, or DDA requirements for comments attached to images for blind users.	4

2(a)	Answers must mention both ring and star topologies making relative comments for each mark.	6

Answers must mention both ring and star topologies making relative comments for each mark.
Maximum two marks per section. Award each point once only.
LAN/small or WAN/large
The ring is a LAN which means it can only be accessed from within the building or organisation.
Messages are passed around all devices on the ring and repeated on to the next if not at the destination address.
It is usually a peer to peer network so all stations on the network have the same access rights.
The star can be a LAN or a WAN linking networks via gateways and a classic example of this is the internet or when large banks link up their branches with the HQ computers.
All traffic goes through the fileserver (hub).
Shape and Position of the fileserver
A ring network is a peer to peer network with the fileserver and all peripherals and workstations on a ring.
In the star network is a client server network and the file server is in the centre of the spokes with peripherals and workstations on the end of each spoke.
(Could be illustrated with labelled diagram).
Security and reliability
There may be more than one fileserver on the ring network and if one goes down the ring can still function by redirecting network traffic to the functioning server.
The ring network depends upon the repeaters sending the signal around the network.
If a repeater fails the single cannot be forwarded but this does not stop limited communication in one direction between some stations on the network.
In the star network is a spoke goes down the others can still function but if the central file server goes down then the network cannot function.
Can add extra 'spokes' without disturbing the rest of the network.
In the star network everything goes through the central fileserver which can have firewalls and proxy servers allowing central control of message switching allow a high degree of security.
In the ring every device has access to the token before repeating it on making easier hacking or corruption possible.
Transmission speeds
In the ring, transmission is in one direction only and therefore can be quite fast. In the star you can have different transmission speeds on each of the spokes, some can be super fast e.g. between file and communications servers and others e.g. to printers can be slower
Cabling costs
Cabling for a local area network such as the ring is less and Ethernet cable is probably sufficient.
However wide area star networks may need expensive fibre optic cabling or even satellite links.
Gateways can also be expensive (if qualified).

Advantages of ring networks:
- the network is not dependent on a central computer
- each computer has the same access as the others so no one computer can 'hog' the network.
- faster speeds possible because of uni direction.

Disadvantages of ring networks:
- if there is a break in the connection (wire or wireless), then the whole network fails
- 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.

Advantages of star topology networks:
- fault tolerant – if one of the cables fails, then the other computers can still be used
- load tolerant – extra computers can be added without much loss in performance because all computers have their own path to the hub
- easy to add extra computers – extra computers can be added without disturbing the network.

Disadvantages of star topology networks:
- higher cost – the large amount of cabling needed makes it a more expensive topology
- dependence on the central hub, switch or router – if the device at the centre of the network fails, then the whole network will fail.

2(b)	**To get full marks have to have at least 1 advantage and 1 disadvantage (max 4)** *Advantages of Wi-Fi:* • allows inexpensive LANs to be set up without cables • allows people the freedom of working anywhere a signal can be received • ideal for networks in old listed buildings where cables would not be allowed to be installed • global set of standards – you can use Wi-Fi all over the world • health and safety – tidier desktop with no trailing cables. *Disadvantages of Wi-Fi:* • power consumption is high – which means laptops soon exhaust their rechargeable batteries • there may be health problems in using Wi-Fi • there may be security problems even when encryption is used • Wi-Fi networks have a very limited range (e.g. 150 ft) • can get interference if wireless network signals start to overlap • transmission speed slower than cable.	4
3(a)	DPA puts an onus on the practice to keep this information secure (1) because of its potential for misuse (1). Illustrated example of any two of the following points that may be in a security policy: Rules on Passwords and user id's Access rights Firewalls Virus checkers Encryption Physical security measures Backup and restoration strategies Staff code of conduct Disciplinary procedures **Not accounts and logs and No marks for a list.**	4
3(b)	**One mark for each relevant point** Auditing keeps a record of who has done what on the network. Auditing keeps records of: • usernames • the times they logged on and off　　　　　　　**Who, what, when** • details of programs they used • details of files accessed • details of changes made • details of from which machine. Auditing is used to identify abuses of the systems by authorised staff (1) and also to investigate instances of unauthorised access (i.e. by hackers) (1). Managing user accounts by allocation of access levels to users.	3

4(a)	**Any 2 from:** **The use of a web crawler** continually searches the web looking for new pages (1) and recording information they find (1) which browses the web and keeps an index of what it finds (1). **Use of a search engine** an application accessed over the internet that maintains indexes of web pages. (1) and logical operators/key words to find the information you require (1). **Use the Uniform Resource Locator (URL)** the recognised method for referring to resources on the internet. (1) If you know the web address (URL) of a site you can simply type it in. (1) **Use hyperlinks** an area of a web page that contains a link to another location on the Web. (1) You can surf the Internet, which means that you are using hyperlinks to move from one area of interest to another. (1)	2x2
4(b)i	FTP is a standard set of rules that have been established to allow the exchange of (large) files over the internet (1). Used for uploading a database of sales from one branch of the organisation to the head office (1). or Used for down/uploading a website from/onto the internet (1). or other relevant example (1).	2
4(b)ii	Product, customer and order information is readily available to the company from anywhere (1) and customers can place their orders/check stock/etc over the internet (1). A database of something on the internet (1) what it is used for (1)	2
5(a)	**Distributed computing** – where a series of computers are networked together (1) and they each work on solving the same problem (1). Each computer shares data processing, storage and bandwidth in order to solve a single problem (1)	3
5(b)	1 mark for a basic description with further mark for expansion with further detail *EXAMPLE* *The SETI (Search for Extraterrestrial Intelligence) project* The purpose of the SETI project is to search for intelligent life outside the Earth and to do this a radio telescope is used. (1) In order to search for the narrow-bandwidth signals lots of computing power is needed. At first supercomputers containing parallel processors were used to process the huge amount of the data from the telescopes. Then someone came up with the idea of using a virtual supercomputer consisting of a huge number of Internet-connected home computers. *Popular Power project: helping to develop flu vaccines*	2

5(c)	**At least one advantage and disadvantage for full marks** *Advantages* • reduces cost because an expensive powerful computer such as a supercomputer is not needed • can pass work to computers anywhere in the world using the Internet • improved performance as each computer can work on part of the data • can improve performance by adding more computers. *Disadvantage* • issues with the security of data spread out on so many different computers • issues with communication breakdowns.		4
6	**6-8 marks** **3-5 marks** **1-2 marks** **0 marks**	Candidates give a clear, coherent answer fully and accurately discussing, with suitable examples the advantages and disadvantages of teleworking. They use appropriate terminology and accurate spelling, punctuation and grammar. Candidates discuss several advantages and disadvantages with some examples but responses lack clarity. There are a few errors in spelling, punctuation and grammar. Candidates make brief points and may give an advantage, disadvantage or example. The response lacks clarity and there are significant errors in spelling, punctuation and grammar. No valid response.	8

Indicative content
There has to be at least one advantage, one disadvantage and one example to get full marks.
Cannot gain mark twice for use of reverse argument.
The advantages of teleworking for the employee
  • 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.
The disadvantages of teleworking to the employee
  • Home costs such as heating, lighting increase
  • Employee may feel isolated
  • Some employers may pay teleworkers less as there is more competition for jobs
  • No workmates to go out with
  • Boundary between home and work is lost
  • Loss of status for some staff – no plush offices, etc.
  • May not be a quiet place in the house to work
  • Passed over for promotion
The advantages of teleworking to the employer
  • Smaller offices are needed
  • Fewer backup staff need to be employed (e.g. cleaners, caretakers)
  • Staff less likely to spend time off sick
  • Reduced office overheads (electricity, gas, insurance, etc.)
  • Staff may be more amenable to working flexible hours
  • Retaining skilled workers / maternity
  • Employ workers from a wider pool of talent
  • Comfortable environment can lead to greater productivity
The disadvantages of teleworking to the employer
  • Change to organisational structure may be needed
  • Hard to determine how hard staff are working
  • Harder for managers to manage the work
  • Increased number of sites for ICT equipment may cause more security risks
  • Employers usually pay for the employees' ICT equipment
  • More difficult to hold meetings
  • Health and Safety checks needed on employee home

7(a)	**Max 2 marks for definition**
	An employee code of conduct consists of rules (1) drawn up by the senior management or their advisors that set out what an employee is/is not allowed to do in the course of their employment. (1) (It also details the sanctions which will be applied should the employee not obey the rules. (1))
	
	Description of any 3 from:
	    Responsibilities
	    Respecting rights of others
	    Abiding by current legislation
	    Protecting hardware and software from malicious damage
	    Complying with licensing agreements
	    Authorisation – what parts of the system they can use
	    Permissions on data access
	    Security defining rules about password disclosure, data transfer rules and personal use of emails and the Internet
	    Consequences of breaking the code
		5

7(b)	**Description of any 3 from:** • Introduction of viruses – by downloading games, not scanning portable media, not keeping virus scanners up-to-date, etc. • Misuse by employees of the ICT facilities, e.g. using telecommunications for own purposes (e.g. phone calls, e-mail, videoconferencing, etc.) and using printers for personal use. • Distribution of material that is racially or sexually offensive – for example, sending offensive jokes by e-mail or text messages, circulating offensive images over the organisation's network, etc. • Misuse of data for illicit purposes – for example, using e-mails and text messaging to bully someone at work or school/college. • Using data to set up own business, etc. • Blackmail, computer fraud or selling to other organisations. • Violating terms of copyright or software agreements thus causing the company to face legal action from software suppliers or other affected organisations. • Taking data from the system and not protecting it, e.g. losing laptop **Any 2 from:** • informal (verbal) warnings • written warnings • dismissal • prosecution	5
8	Most organisations have a corporate information technology security review which looks at the computer processed information with a view to <u>identifying the risks</u> of unavailability, errors and omissions, abuse, unauthorised disclosure and to determining their potential implications. Each risk will need to be examined from the point of view of the security and the loss assessed and its <u>likely occurrence</u>. The aim is to identify those systems crucial to the organisation and to look at the possible <u>consequences of loss</u> of such systems. Organisations will need to look at <u>how well they are equipped to deal with potential threats</u> and <u>how much they are prepared to spend to minimise the risk</u>. *One mark for a list of four key points.*	4

9	**6-8 marks**	Candidates give a clear, coherent answer with a full and accurate discussion using suitable examples. They use appropriate terminology and accurate spelling, punctuation and grammar.	8
	3-5 marks	Candidates discuss several points with some examples but responses lack clarity. There are a few errors in spelling, punctuation and grammar.	
	1-2 marks	Candidates make brief points and may give an example. The response lacks clarity and there are significant errors in spelling, punctuation and grammar.	
	0 marks	No valid response.	

Indicative content
Answers have to consider at least one point for and one against, with at least two examples to get full marks. A well argued point or detailed example can gain a further mark.
- The Internet is for everybody and no one actually owns it.
- There is little control over the content of the material on the Internet, although some governments have started to control what can be seen.
- There is also no control over the people who can access the material on the Internet.
- This means that unless special software is used, children can easily gain access to pornographic or violent images.
- The lack of 'policing' of the Internet also means that the information is not checked to make sure that it is accurate.
- It is therefore up to the users of the Internet to check the material's accuracy.
- When you are using information off the Internet you need to be able to check the material for its suitability and accuracy.
- There are a lot of pornographic images/videos on the Internet.
- There are laws covering the production and distribution of this material but as much of this material comes from other countries, where the material is perfectly legal, there is not much that can be done to stop it.
- The main worry adults have is that young children could accidentally access this material.
- Even with a software filter it is hard to be completely sure material is excluded.
- If a site is banned it could make it more popular.

10(a)	Management Information Systems (MIS) are organised collections of people, procedures and resources designed to support the decisions of managers. (1)
	
	At least four pros and four cons to gain 8 marks.
	Candidates may include some of the following:
	    Features of good MIS
	    • Accuracy of the data
	    • Flexibility of data analysis
	    • Providing data in an appropriate form
	    • Accessible to a wide range of users and support a wide range of skills and knowledge
	    • Improve interpersonal communications amongst management and employees
	    • Allow individual project planning
	    • Avoid information overload
	    • Allow speedy decisions for urgent situations
	    Factors which can lead to poor MIS
	    • Complexity of the system
	    • Inadequate initial analysis
	    • Lack of management involvement in initial design
	    • Inappropriate hardware and software
	    • Lack of management knowledge about computer systems and their capabilities
	    • Poor communications between professionals
	    • Lack of professional standards
		9

10(b)	**One mark for each point up to max 8.** e.g. Corrective 'Bugs' (1) which may not have been identified during the testing process (1) become apparent when the system is operating in a live environment (1) Perfective Users may, after a period of time (1) find a particular aspect of the software unsatisfactory (1) e.g. tables may be difficult to format for printing (1) A security issue (1) e.g. a virus threat (1) may emerge which means that the system requires an extra level of protection (1) The software provider may discover a way to make the application run more efficiently (1) e.g. floating editing windows (1) Adaptive Changes in the business environment (1) e.g. change in legislation (1) may mean that the software is required to perform tasks it wasn't originally designed for (1) New software or hardware may be purchased (1) the integration of which requires changes to existing systems (1) e.g. purchase of new printers with incompatible drivers (1) Condone one mark for use of terms, corrective, perfective, adaptive.	8
11(a)	**Suitable definition of a relational database, such as:** A large collection of data items and links between them (1) structured in such a way that it allows it to be accessed by a number of different applications programs (1) a group of tables linked together by primary and foreign keys (1).	2

11(b)	*Award one mark for **each** table name,*
	*One mark for **each** primary key field,*
	*One mark for **two sensible** foreign keys.*
	
	Example of one possible full mark answer:
	    CUSTOMER (<u>CustomerID</u>, Name, contact no, address1, address2, etc.)
	    ORDERS (<u>OrderID</u>, Date, *StockID*, *CustomerID*)
		5

11(c)	**Data Warehousing (any two points)** The mail order company generates huge quantities of data stored in a consistent order to make interrogation more productive. Data is non-volatile and time invariant (archive data). Used to support organisational decision making. **Data Mining (any two points)** Is interrogating the data It is a speculative process / investigates potential patterns Presumption is that dormant within the data are undiscovered patterns / groupings / sequences / associations. Software uses complex algorithms to search for patterns. Returned information can be tested for plausibility. Data if of value can be processed into a report to help decision making. Could allow company to find a previously unknown relationship between regions of the country and food preferences and they can then target special promotions.	4
11(d)	**Two marks for each description** **One mark for definition and second mark for expansion or example. (x 3)** **Data redundancy** It refers to the unnecessary duplication of data. In a flat-file database details about such information as customer details will be duplicated. In a well designed relational database there should be no 'repeating attributes', no piece of data should be unnecessarily repeated*.* **Data integrity** The integrity of data is the correctness, i.e. the extent to which it truthfully represents the original information. One of the problems of maintaining integrity arises when updating occurs, and every record has to be changed in a flat-file database, if one record was left unchanged the data would no longer be wholly correct. In a relational database you only have to change data in one table and all other references in any other table will automatically be changed*.* **Data consistency** When data is held in more than one file it should be stored in a consistent way. A date field could be stored in file as a text field but in another field as a date/time field and the data would be incompatible. In a relational database because the attributes of any one entity are contained within one file, there is no risk of the same attribute being stored in a different format in a different file (Spelling mistakes in names).	6
	TOTAL	**90**