GCE AS/A LEVEL

WJEC GCE AS/A LEVEL in

INFORMATION AND COMMUNICATION TECHNOLOGY

DESIGNATED BY QUALIFICATIONS WALES

SAMPLE ASSESSMENT MATERIALS

Teaching from 2017

This Qualification Wales regulated qualification is not available to centres in England.

For teaching from 2017
For award from 2018

GCE AS AND A LEVEL ICT

SAMPLE ASSESSMENT MATERIALS

Contents

GCE

INFORMATION AND COMMUNICATION TECHNOLOGY

UNIT 1: IT1
Information Systems

SAMPLE ASSESSMENT MATERIALS

(2 hours 15 minutes)

For Examiner's use only		
Question	Maximum Mark	Mark Awarded
1.	6	
2.	5	
3.	8	
4.	6	
5.	6	
6.	6	
7.	5	
8.	18	
9.	4	
10.	16	
Total	80	

INSTRUCTIONS TO CANDIDATES
Use black ink or black ball-point pen.
Write your name, centre number and candidate number in the spaces at the top of this page.

Answer **all** questions.

Answers should be written in the spaces provided.
Where the space is not sufficient for your answer use a continuation sheet, taking care to number the continuation correctly.

The intended marks for questions or part questions are given in brackets [ ]. You are advised to divide your time accordingly. The total number of marks available is 80.

You are reminded of the necessity for good written communication and orderly presentation in your answers.

Quality of written communication will be assessed in question 8*(b)*.

Make sure you hand in your spreadsheet with this booklet at the end of the examination.

SECTION A

Answer **all** *questions.*

1. Define the terms *information* and *knowledge*. Then give **two** different examples to illustrate the relationship between information and knowledge. [6]

……

……

……

……

……

……

……

……

……

……

……

……

2. Explain the purpose of encryption. Describe how encryption could be used in messaging and why this would be adopted. [5]

……

……

……

……

……

……

……

……

……

……

……

3. Organisations make extensive use of ICT. Describe **four** factors affecting the efficiency of data processing systems. Do not use data itself in your answer. [8]

……

……

……

……

……

……

……

……

……

……

……

……

……

……

4. A company uses both *CAD* and *CAM* to develop and make a product.

(a) Describe the role of *CAD* and *CAM* in this process. Use a suitable example in your answer. [3]

……

……

……

……

……

……

(b) Describe, using an example, what is meant by 3D-Printing. Give an advantage 3D-Printing gives when creating models. [3]

……

……

……

……

……

……

5. Hospitals make substantial use of data handling software. Describe the following features and explain how **each** benefits a hospital.

(i) Query [2]

……

……

……

……

……

……

(ii) Validation [2]

……

……

……

……

……

……

(iii) Import/Export [2]

……

……

……

……

……

……

6. People and organisations are very concerned about the increasing use of computers for criminal purposes. Name **two** Acts. For **each** Act describe a concern and how the legislation has been used to try and address it. [2×3]

……

……

……

……

……

……

……

……

……

……

……

……

7. State what is meant by the term *EPOS*. Describe the process that takes place at the *EPOS* and give **two** benefits of *EPOS* for the **customer**. [5]

……

……

……

……

……

……

……

……

……

……

8. The Health Service makes extensive use of *expert systems, blood tracking* and *body scanning* in caring for patients.

(a) State the **three** main components of an expert system. Describe the *advantages* and *disadvantages* of using an expert system for patient care. [8]

……

……

……

……

……

……

……

……

……

(b) Describe how blood tracking and body scanning are used in patient care. Use examples in your answer. Discuss the *advantages* and *disadvantages* **each** of these methodologies has brought to patient care. [10]

……

……

……

……

……

……

……

……

……

……

……

……

……

……

……

……

……

……

SECTION B

Answer **all** *questions.*

9. *(a)* Describe what is meant by *simulation modelling*. [1]

……

……

(b) Describe the advantages and disadvantages of using *simulation modelling* in car crash analysis. [3]

……

……

……

……

……

……

YOU MUST REFER TO YOUR OWN SPREADSHEET TO ANSWER THE FOLLOWING QUESTION.
IF NO SPREADSHEET EVIDENCE IS SUBMITTED THEN NO MARKS CAN BE AWARDED.
MAKE SURE THAT YOU SHOW IN YOUR ANSWER WHERE THE PROCESSES, FUNCTIONS/FORMULAS CAN BE FOUND IN YOUR SPREADSHEET. FOR EXAMPLE PAGE 6 CELL D4.

10. *(a)* Describe the purpose or function of **one** formula from list **A** and **two** *different* formulas from list **B**, which you have used in your spreadsheet. [6]

A: SUM, COUNT, MAX, MIN, AVERAGE, RAND
B: Single IF, Multiple IF, DATE, ROUND

……

……

……

……

……

……

……

……

……

……

……

……

(b) Describe **two** methods you used in your spreadsheet to try and ensure that incorrect Data was not entered in your spreadsheet. [6]

……

……

……

……

……

……

……

……

……

……

……

……

(c) Describe a **SORT** used in your spreadsheet and state why you required the data to Be sorted. [2]

……

……

……

……

(d) Describe an example of **absolute addressing** you used in your spreadsheet. Give the reason you used it. [2]

……

……

……

……

ENSURE YOU ATTACH THE PRINTOUTS OF YOUR SPREADSHEET TO YOUR EXAMINATION ANSWER PAPER.
END OF PAPER

GCE MARK SCHEME

Sample Assessment Materials

INFORMATION & COMMUNICATION TECHNOLOGY
IT1
1241/01

1.	Information is processed data or data in a context or with a meaning. Knowledge is derived from information by applying rules to it. Example: Information Race times Swimmer 1 63.6s, Swimmer 2 59.3s, Swimmer 3 59.7s Knowledge: Swimmer 2 is the fastest and consequently wins. Example: Information, John's birthday is 11th May 2014 Knowledge, John is 18 and so now he can vote in the next election. The rule must be stated or implied. (answer is likely to show two stages) and evidence of application	1 1 1 1 1 1
2.	**Purpose** To ensure that only someone who is authorised to access data will be able to read it / Converts data into a secret code Usually used to protect data in transit or data which is worth stealing. **How** Encryption would be used in messaging to provide end to end security for users. Data would be encrypted at the point the user presses "Send" and decrypted for an authenticated user at the other end. **Why** This provides assurance to the user that private messages cannot be intercepted and read by others.	1 1 2 1
3.	**(Factor 1 mark Extension 1mark)x4** **Any four from: (If only 3 or 4 listed points - 1 mark)** **Software** - Does the software put a big demand on the system - does it work with other software. Relevance to task **Suitability of the OS** - If there is a need for quick up to date information, there is no point running it on a batch processing system. **Insufficient testing** - Has the system been checked in all sorts of situations / volume **Maintenance procedures** - Is there someone whose job is to ensure that the data and software is kept up to date. **Proper backups** – maintaining an incremental system **Hardware** – e.g. if the system has an old slow processor/memory will take too long to process the data, cost of upgrading **Other factors could be:** Change in circumstances during development Speed of implementation Compatibility - Do the different devices talk properly to each other. Poor communication with the user - Does the final system fit in with what was requested. Competence of users / poor training Post-implementation procedures – Do they use training manuals / error logs / auditing procedures. Cost – of maintaining software upgrades – of developing system – of installation. Hardware support / reliability – **Care must be taken not to award marks for duplicate reasons.** **NOT old software or out of date software unless justified** **Nothing to do with data entry** **Memory and processor speed are NOT distinct points**	4x2

4.a	**For three marks must include design on computer and making object using computer driven machine (design 1 and make 1) (object and process 1)** **Examples of 2 mark answers –** • CAM is the use of computers to control the manufacturing process using a design created in a CAD package. • CAD designs an object using a computer and CAM makes the object using a computer guided machine. **Example for 3 marks** - Clothing designed in CAD package and then cut out correctly and stitched by a CAM package - Or similar.e.g. design and make packaging.	3
4.b	**Use** A method of printing solid objects by using successive layers of materials are formed under computer control. **Examples (1 mark for any one)** To produce foods such as crackers, pasta and pizzas – being looked at for space travel. In medicine, printing replacement bones for facial reconstruction. **Advantage** Model can be checked for errors and easily altered before going to the expense of printing it out. (1) The final product can be printed much quicker than by creating by conventional methods (1) and is a lot cheaper when producing small quantities.(1)	1 1 1
5 (i)	**Definition** A query is when you interrogate (search, sort, filter) a database to find some information. **Example** A search to find all the patients with breathing problems because they need to be sent flu injection letters. **Need to indicate why to show whether query is appropriate.**	1 1
5(ii)	**Definition** Validation - Checking that the right sort of (sensible) data has been entered into the database **Example** To avoid the mix up between height and weight of a patient when entering data and the wrong dose consequently administered.	1 1
5(iii)	**Definition** Report – The output from a database in which the results are presented in a way that is controlled by the user. (formatted, i.e. tables / graphs / grouping / statistical summary/ results of searches) **NOT It is a printout.** **Example** Producing formatted lists of patients who are in need of screening tests. **A mark for the example can be given if the definition is wrong but their answer involves formatting.**	1 1

6.	**Must name the Act.** **Max 3 marks for each Act, i.e. name (1) purpose (1) consequence (1).** **Cannot use the same consequence twice.** **To get the three marks must give at least one consequence.** **Can get marks for other Acts.** **No more than two marks for naming Acts .** Data Protection Act, Copyright Act, Computer Misuse Act, Malicious Communication Act (Could mention Freedom of Information Act and Intellectual Property Rights or RIP). **The Computer Misuse Act** (1) was introduced to make it illegal for people hacking into your computer (1) by giving the hackers a fine (of £2000). (1) / the Act also made it illegal to use the information you see for blackmail purposes (1) and you could get a further (£2000) fine and go to prison. (1) Identity theft. Spreading viruses, etc. Phishing. **DPA** - The DPA (1) makes companies who keep personal data keep the data secure (1) or they could be heavily fined (1). Onus on companies in DPA to register. Currency of data. Obtain data lawfully. Used for given purpose. **Copyright Act** - copying software / images / music. **NOT Pornography, Cyberbullying, Paedophilia**.	6
7.	**Electronic Point Of Sale (1)** **Barcode scanned (1) then other point from the list below** Code matched. Price returned to screen. One deducted from stock. Reorder level checked. Automatic reordering. Print itemised bill. **Any two from:** **Benefits** Less need for physical security as not have to carry as much cash. Less time spent waiting in queues so happier. Gives them additional services e.g. cashback, topping up your phone. Allows the customer a variety of payment methods. Allows more special offers – loyalty cards, BOGOF, vouchers. Allows self -scanning.	3 2

8.a	**One mark each for naming the three components** **Up to five marks for examples, advantages or disadvantages.** **Answers have to cover all 3 sections and there has to be at least one advantage, disadvantage.** **Main components** Knowledge base. Inference engine. User Interface. **Advantages** • The computer can store far more information than a GP. It can draw on a wide variety of sources such as stored knowledge from books, case studies to help in diagnosis and advice on things such as prescriptions / symptoms • The computer does not 'forget' or make mistakes – remembers obscure cases of heart diseases • Data can be kept up-to-date e.g. adding more results of radiology scans / constant updating • The expert system is always available 24 hours a day • Will never 'retire'.-- No loss of expertise • The system can be used at a distance over a network. Therefore rural areas or even poorer third world countries have access to experts • Provides accurate predictions with probabilities of all possible problems with more accurate advice especially for obscure illnesses • Some people prefer the privacy of 'talking' to a computer rather than talking to a GP • Gives the doctor more time to deal with other patients / saves overloading doctors in epidemic/pandemic / more time to deal with serious cases • Can provide a second opinion • It can help train young doctors in unfamiliar diseases • People can do an initial diagnosis from home saving them travel and time costs especially if in a rural area or have long waiting lists to see a GP, e.g. if you suspect your child has a rash you could quickly check the symptoms for meningitis • Cheaper to update than to train doctors • Training using simulators • Using NHS Direct allows self- diagnosis **Disadvantages** • Over reliance on IT system / Loss of doctor expertise • Cost to buy and set up the system • Some people do not like to talk to a computer • People can convince themselves that they are worse than they from misusing the online version • Lacks the 'human touch' – lack of personal contact • Dependent upon the correct information being given. If data or rules wrong the wrong advice could be given. / GIGO • Expert systems have no "common sense". They have no understanding of what they are for, nor of what the limits of their applicability are, nor of how their recommendations fit into a larger context. If MYCIN were told that a patient who has received a gunshot wound is bleeding to death, the program would attempt to diagnose a bacterial cause for the patient's	8

	symptoms. • Expert systems can make absurd errors, such as prescribing an obviously incorrect dosage of a drug for a patient whose weight and height are accidentally swapped by the clerk. Example of why is needed to differentiate from GIGO **Do not award contradictory answers**		
8.b	7-10 marks 4-6 marks 1-3 marks 0 marks	Candidates give a clear, coherent answer describing how blood tracking and body scanning are used in patient care and discuss their advantages and disadvantages. They use appropriate terminology and accurate spelling, punctuation and grammar. Candidates state how blood tracking and body scanning are used in patient care and describe some advantages and disadvantages but responses lack clarity. There are a few errors in spelling, punctuation and grammar. Candidates simply make brief points and may not give examples, advantages or disadvantages. The response lacks clarity and there are significant errors in spelling, punctuation and grammar. No valid response. **One mark for each name and one for description. Up to six marks for advantages and disadvantages.** **Must refer to body scanning and blood tracking in patient care with examples to get full marks.** **MRI:** (1) provide a tremendous level of detail on tissue information, i.e. very good for detecting brain tumours.(1) OR **CAT:** (1) produces a complete 3D model of a patient's bones and internal organs. (1) OR **PET:** (1) produces three-dimensional image or picture of functional processes in the body (1) **Advantages** Allows (accurate) diagnosis without the need for surgery. Leads to faster recovery. Removes the danger of post operative infections. Surgeon better prepared as knows what he is going to find before cuttingopen the body. **Disadvantages** Expensive to purchase or expensive to run/maintain (NOT IF IN 8a) 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 –exposure to radiation. Patients with pacemakers and metallic limbs cannot go through scanners. Need for expert training / interpretation. Postcode lottery. **Blood bar coding** (1) allows the tracking of blood from its donation to its use(1) OR **Bracelet with a barcode**(1) worn by patient is matched with bar code on the blood bag / donor (1)	10

	Advantages 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. **Disadvantages** Damaged bar codes can cause delays. **NO GENERAL DISADVANTAGES e.g. power cuts.**	
9.a	Use of a program to predict the behaviour of a real life system. **Answer should have software and at least one of real life / investigative (what if) Computer uses a mathematical formula implies use of software.**	1
9.b	**Must be at least one advantage and one disadvantage** **Advantages** • Cheaper as do not have to physically destroy cars • Safer as nobody is really hurt • Can explore different scenarios more easily **Disadvantages** • Model could oversimplify the situation • Bad data errors in formulas will spoil accuracy • No model is ever 100% accurate	3
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) and 10 (c) 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	Two marks for each formula (1 from A and 2 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).	6

	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.	
10b	**What (1) Further detail (1) Why or customised error message (1)** **2 x one mark for the correct name of a method and up to 2 marks for further details.** Any validation method or spinners or drop-down boxes or tick boxes Examples: • I used a list box on transport methods on page 4 in cell D3 (1) which meant users were restricted to a set of choices of data (1) to the items in the list such as car, bus, train, bike, walk (1) or speeded up the entry process. • I applied a range check on hotel room number in cell F5 on page 6, (1) by only allowing whole numbers between 1 and 99 to be entered (1), because there are only 99 rooms in the hotel (1) (Alternatively - I created an error message "data must be between 1 and 99". (1))	2x3
10c	**What and why** I sorted the names of my customers on page 13 as it made it a lot easier to look for people when their surnames **were** in alphabetic **order**. / to make a list ready for Vlookup.	2
10d	**What and why** I used absolute addressing to help with the use of VAT in my calculations. This can be seen on page 5 cell A13. If the rate of VAT changes all I have to do is to change the value in this cell and it changes the total price of every other component.	2

GCE

INFORMATION AND COMMUNICATION TECHNOLOGY

UNIT 3: IT3
Use and Impact of ICT

SAMPLE ASSESSMENT MATERIALS

(2 hours 30 minutes)

ADDITIONAL MATERIALS

In addition to this examination paper, you will need:

• a 12 page answer book.

INSTRUCTIONS TO CANDIDATES

Use black ink or black ball-point pen. Do not use a gel pen or correction fluid.

Answer **all** questions in Section A and **one** question group in Section B.

Use both sides of the paper. Write only within the white areas of the book.

Write the question number in the two boxes in the left hand margin at the start of each answer.
Leave at least two line spaces between each answer.

The intended marks for questions or part questions are given in brackets [ ]. You are advised to divide your time accordingly. The total number of marks available is 90.

You are reminded of the necessity for good written communication and orderly presentation in your answers.

Quality of written communication will be assessed in question 12.

SECTION A

Answer all questions.

01 Other than layout appropriate to task and use by disabled people, describe, **in detail, three** other factors that should be taken into account when designing a good user interface. [3×2]

02 Describe **five** examples of how a suitable Human Computer Interface (HCI) can meet the needs of disabled users. In your answer you must state the disability or need. [5]

03 Good quality information is needed to make informed decisions. Other than *accurate* or *complete,* describe **two** *different* characteristics of good quality information, illustrate **each** characteristic you have described with an appropriate and *distinctly different* example. [4]

04 A system analyst has been asked to update a company's network. Discuss the relative advantages and disadvantages of **ring** and **mesh** network configurations he would include in his feasibility report. [6]

05 The network infrastructure of a school needs updating. The network manager is considering installing a wireless network. Discuss the advantages and disadvantages to the school of using a wireless network. [4]

06 The school is based on a number of sites and consequently the network manager needs to use remote management to simplify his job. Describe **five** tasks that the network manager could carry out using remote management. [5]

07 Discuss the advantages and disadvantages videoconferencing brings to an organisation or its employees. [5]

08 A system analyst has been employed by a council to produce a new computer based system to replace the system currently running their central lending library. Other than observation, describe **two** methods the analyst could use to investigate their current system. [2×3]

09 A financial institution has a 'code of conduct' for all its employees who use its ICT systems. Describe **five** guidelines it should contain, other than the consequences of breaking the code. [5]

10 A doctors' practice has installed a new computer system to help run the practice. Once this system is up and running, it has to be maintained. Describe **three** different methods of system maintenance and illustrate each method with appropriate examples. [3×3]

11 Other than establishing a code of conduct, discuss **five** possible operational procedures which could be introduced to prevent the misuse of data. Use distinct examples to illustrate these procedures. [5×2]

12 Describe what is meant by change management and then discuss in detail **three** possible effects of change. [8]

SECTION B

Answer **either** *questions 13 to 14* **or** *questions 15 to 18.*

13 Companies and their customers are increasingly dependent on electronic information. The security of electronic data is very important to every company and their customers. Describe **three** different types of threat to a company's data and illustrate **each** type of threat with a **different** detailed example. For **each** of the different threats, describe a distinctly different consequence for a company or its customers, should the security of the data be compromised or the data destroyed. [3×3]

14 Organisations find that having an ineffective Management Information System (MIS) can be counter-productive. Describe, **in detail, four** factors that can help prevent a MIS being non-effective. [4×2]

15 Organisations now store vast amounts of data in normalised form in relational databases. This data is used as a data warehouse and is mined to aid decision making. Explain what is meant by:

- Normalisation [2]
- Relational database organisation [2]
- Data warehouse [1]
- Data mining. [1]

16 A relational database approach has many advantages, including increased security. Describe the positive security implications of a relational database over other types of databases. [2]

17 A hotel consists of a number of rooms. Rooms can be booked by customers. A customer can make several bookings.
Draw an Entity Relationship (ER) diagram to represent this situation. [3]

18 Distributed databases are used by some hotel chains. Describe **two** benefits to a hotel chain of using a distributed database. Describe **two** security issues associated with distributed databases for the hotel chain. Suggest a different method the hotel chain could use for overcoming each of these issues. [6]

GCE MARK SCHEME

Sample Assessment Materials

INFORMATION & COMMUNICATION TECHNOLOGY
IT3
1243/01

1	**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.** **Note: explanations must be distinctly different and match the factor. An example can count as an extension.** NOT disabled access, layout appropriate to the task NOT Consistent Layout NOT age **Expertise of the user/ ability of user / difference between novice and expert user** An expert user will need shortcuts so that the task can be completed as quickly as possible whereas a novice will need a number of steps to guide them. NOT age **Consistency of signposting and pop up information** 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 **Clear navigational structure** 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 learn their way around the system. **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 **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). **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. **On Screen / online helpfiles (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. No marks if can be read as a Google search	3x2
2	**1 mark per point (have to state need and how helped) to a maximum of 5 marks** • Visually impaired people can have their screens configured using large fonts. • Magnify areas of the screen for people with poor eyesight. • If a person is visually impaired, then ICT can help them by getting the computer to speak the words when they are being typed in. • Visually impaired people can also use special Braille keyboards to enter the data and can use Braille printers to produce output which other blind people can read. • Visual messages on screen instead of sound for the deaf. • Use of correct colour schemes for colour blind people. • Use large mouse or trackerball for people with poor co-ordination. • Use of speech recognition rather than keyboard/mouse for those who cannot use their arms, etc. • Eye movements (eye typer) for entering text / controlling devices for those who cannot use their arms, etc. • Blow pipes (sip and puff switches) or eye movements for entering text / controlling devices for those who cannot use their arms, etc. • Brainwave controlled devices for physically handicapped with no arm/hand movement. • Condone example of not using frames or patterned backgrounds, or DDA requirements for comments attached to images for blind users • Background colours changed for dyslexia **Other examples might be given - Accept any suitable point.** **Allow repeated need**	5

3.	**(1 mark for process 1 mark for example) x2** **NOT aiding the decision making process** **Process: Monitor progress** **Example:** A shop analyses the performance of its POS terminal operators and warns operators who are too slow or make too many mistakes. Information obtained by market research and sales figures can help achieve this. **Process: Can target reasoning and strategy (resources) making to gain advantage over competitors** **Example:** Buy more of a certain commodity because sales are good. Advertising and marketing a product should be aimed at people likely to buy it otherwise it is a waste of time. **Example:** Information can identify gaps in a particular market which can then, on the basis of sound information be filled. **Example:** A manufacturer spends money developing a new product because they have seen a gap in the market. A company developed special sized shampoo bottles when airline companies limited the amount that could be taken into the cabin. Information about customers' buying habits is valuable here and can lead to an organisation or company becoming more profitable. Information can tell an organisation how well it is doing compared to its competitors. **Example can be worth 2 marks if concept of targeting resources is clear.** **Example 1:** Company decides to spend money on advertising in Area B to promote a particular product. ('… because they have noticed sluggish sales' may qualify for spotting trends mark). **Example 2**: Information from research is used to identify gaps in a particular market which can then be filled by developing a new product. **Process: Spot trends** **Example:** Analyse sales data and realise when something is out of fashion e.g. sales of tape recorders or if one region buys more of something than another.	2x2
4.	**Answers must mention both ring and mesh topologies making relative comments for each mark.** **Indicative content:** **These points could be made but must be related to each topology.** **ACCEPT THE OPPOSITE OF ANY OF THESE POINTS BUT NOT TWICE** **Advantages of ring** • 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). • No collisions. **Advantages of mesh** • Fault tolerant – if one of the cables/routes fails, then the other computers can still be used.* • Easy to add extra computers – extra computers can be added without disturbing the network.# • Data can be transmitted from different devices simultaneously, Can withstand high traffic **Disadvantages of ring** • Faults are difficult to locate.	6

	• 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*. **Disadvantages of mesh** • There are high chances of redundancy in many of the network connections • Overall cost of the network is high compared to other networks • Set-up and maintenance of this topology is very difficult. • Harder to administer the network. **ACCEPT THE OPPOSITE OF ANY OF THESE POINTS BUT NOT TWICE i.e. an advantage of a ring can be a disadvantage of a mesh e.g. only give one of the two * or one of the two #** **N.B. Do not accept points which are really about peer to peer or client server Networks**	
5.	**Candidates should give two advantages and two disadvantages but condone three advantages and one disadvantage or one advantage and three disadvantages** **Advantages of Wi-Fi:** • Allows inexpensive LANs to be set up without cables. • Allows pupils and staff 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 (802.11) (for all devices). • Can use a variety of devices such as tablets, mobile phones, etc • 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) /black spots in buildings • Can get interference if wireless network signals start to overlap • Transmission speed slower than cable. **NOT distraction from use of phone** **NOT broadband issues**	4
6.	**Remote management is to do with stations not users** **One mark for each of any five points:** • 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 • Log off users who have forgotten to do so. • 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. • Clear printer queues (remotely) at stations. **NOT manage passwords / delete files / other tasks normally done at the server OR Monitoring users/access**	5

7.	**Max of 3 for advantages or disadvantages** **Advantages (up to 3)** • Much cheaper as they do not have to pay for transport costs/accommodation for employees • Experts not wasting time travelling • Meetings can be called at short notice without too much planning • Short meetings can be conducted where it would not be feasible for people to travel long distances for such short meetings • Allows people to work from home (teleworking) and still 'meet up'/ have meetings • Allows staff to attend meeting while out of the country /on holiday • Can give you a better visual image of the product • General facial expressions/ body language can be seen over the telephone **Disadvantages (up to 3)** • COST: The cost of specialist/dedicated videoconferencing equipment is expensive to buy, install and maintain • QUALITY: Although documents and diagrams in digital form can be passed around, an actual component cannot; e.g. cannot feel the quality of materials. Physical nuances/body language can be missed. • SIGNAL: Poor image and sound quality (Must be qualified) e.g. restricted bandwidth/failure of connection/buffering/lag/image quality is seldom as you would get with a tv, owing to have to compress and decompress signals over the communication link / need for a good/strong/fast internet connection for it to work **NOT problems due to time zones** **NOT work life balance** **NOT self conscious**	5
8.	**Indicative content** **(3 marks for each of 2 techniques)** **One mark for describing method (must have method and with who/what) and two marks for expansion / purpose / specific use** **A detailed description of a point can be given 2 marks** **Do not give duplicate answer *** **Only allow what the system does, problems and future improvements once as they could appear in any of the four techniques.** <u>Interviews with managers</u> / users / workers / customers (not 'people') about the current system (1) - (who could appear later) • To find out how departments work overall • Accountants to find out how specific activities such as payroll are performed • Identify current problems • Identify what they want the new system to do and what data is processed and what information is produced • Can supply fine detail on how current system works, individuals may supply extra information not thought of before / expansions / extra information • Very time consuming but as a lot of people need to be contacted • Needs skilled interviewers to get the correct information out of people. • Have different levels of questions to different people **Inspection of records** studying the paper based information / electronic logs (produced by the company at the moment) (1) - (what could appear later) • To see what information is held at present and how • To see how communications between different departments takes place now	2x3

	• To identify any problems or faults in procedures • e.g. organizational charts, job descriptions, training aids and guides, looking at existing files, standard letter • **Questionnaires which are given out to managers** / users / workers / customers to gather information on the company (1) - - (who could appear later) • Analysts do not waste time with face to face conversations and can stick to the important points without digressing / Quicker to get a lot of data • The questionnaires can be done without the analyst being there and workers can take their time over their answers, • They can state how they want the new system to work • Feasibility of when the recipient can answer the questions • Workers however may misinterpret the meaning of the questions and give misleading answers/ may not be truthful • Problem is that people forget to fill them in and hence an incomplete picture. • Response rate from posted surveys is often poor. • Cost involved in hiring people to ask others to fill in questionnaires • Economical to reproduce and distribute. • Questionnaires must be well designed to obtain the necessary detail. • Audit of employee skills to identify future training needs • Allows quick statistical analysis of responses / Quantitative analysis	
9.	**Description or a clear example (Must relate to the use of ICT) or expansion of any 5 of the following areas: – List gets 1 mark** • Responsibilities - (what they can do and can't do) • 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 • Not using equipment/software for personal use -- and personal use of emails and the Internet	5
10.	**All three of the following methods: One mark for naming, one mark for description and one mark for example x 3** **Perfective maintenance** (1) – improving the performance of the <u>software</u> (1). **Example:** 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). The software provider provides upgrades which will improve the performance of the software (1). **Corrective maintenance** (1) – bugs in the software which were not discovered during testing may need correcting (1). **Example:** A piece of software may crash when being used with another piece of software (1). A piece of software may crash when used with a particular item of hardware (1). Software may present a security risk which needs correcting (1). Problems with reports not being printed out properly (1) **Adaptive maintenance** (1) – software may need to be changed owing to the changing needs of the business or organisation (1).	3x3

	Example: 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). Adapting the software to work with newly developed operating systems software or new hardware (1). A new virus threat/hacker threat means that the software will need to be adapted to protect against this (1)	
11.	**One mark for discussion of each factor and one for each further explanation/example saying how a company carries out each one x5**	5x2

Screening potential employees	Ensure staff are monitored Fit employee to the task DBS checks
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 regularities 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

Accept any reasonable example or expansion such as who or what or when or how.

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.

NOT establishing a code of conduct

12.	**6-8 marks** Candidates give a clear, coherent answer fully and accurately describing 6-8 factors or 4 well argued. They use appropriate terminology and accurate spelling, punctuation and grammar. **4-5 marks** Candidates briefly describe 4-5 factors used or 2-3 well argued, but responses lack clarity. There are a few errors in spelling, punctuation and grammar. **1-3 marks** Candidates simply list factors or give a brief description of 1-3 or one well argued. The response lacks clarity and there are significant errors in spelling, punctuation and grammar. **0 marks** No appropriate response. **Indicative Content** **2 marks for explanation of change management** **Change management** is a structured approach for ensuring that **changes** are thoroughly and smoothly implemented, and that the lasting benefits of **change** are achieved. The focus is on the wider impacts of **change**, particularly on people and how they, as individuals and teams, move from the current situation to the new one. **The skills required and not required** New ICT systems need new skills and staff must be prepared to learn these skills. Old skills may not be needed so staff may need to be re-trained. The introduction of new systems will mean the staff will require training on how to use them. The increased use of ICT usually means an increase in the number of skilled jobs at the expense of unskilled jobs. **Organisational Structure** Companies may see a new system as an opportunity to change their organisational structure. Staff may be asked to do a greater variety of tasks. Staff dissatisfaction as they my be moved from existing groups to work with new colleagues. Someone who has worked in a senior position may find someone else promoted above them. **Work Patterns** In a global market organisations may have to work 24/7. Flexibility may be require in terms of work times with more part-time work being available. This may suit some people as they can fit it around their lifestyle e.g. parents of small children but may not get time off at the same time as their partners. **Internal Procedures** Staff asked to take on more responsibility and do a wider variety of tasks e.g. admin staff may now be asked to talk to customers. Some staff may be asked to take part in sales e.g. bank clerks asking customers about insurance. Procedures may change and become more streamlined as a result of a new system. Introduction of a code of conduct for all staff specifying what they can and can't do with the ICT systems. **Fears of change** Fear of redundancy Fear of reduction in status and job satisfaction. Fear of looking ridiculous. Changes in location	2 3x2

13. **Answers must be sentences and not a list.**
Consequences must match threats. List of consequences 1 mark.
List of threats 1 mark. — 3x3

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 three different consequences for customers or company.
No mark for prevention

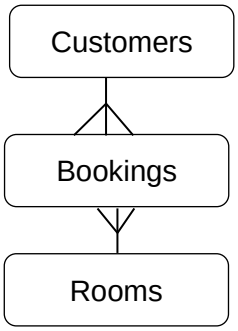
Threat	**Example**	**Consequence (could be interchangeable)**
Terrorism	Cyber attacks to slow down or prevent online services	Loss of reputation
Criminal vandalism /sabotage	Attacks on firewalls by viruses to destroy data	Loss of business and income
Theft by Hacker/employee (White collar crime)	Deliberate destruction of the physical data 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	Loss of business and income
Accidental altering of data	Overwriting files: accidental deletion of files	Costs of recovering data
Theft of data	Stealing storage media containing data	Bankruptcy
Fire	Electrical fire in server room	Cost of new hardware

14. **1 mark for factor and second mark for good example or expansion x4** — 4x2

Accuracy and relevancy of the data
- The data used from the transaction systems that supply data to the management system must be accurate.
- Avoid information overload by not producing any data that is not needed as this can waste time and make the information harder to use.

Flexibility of the system
- 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 own queries quickly. **Providing data/information in an appropriate format (form)** • 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. **Accessible to a wide range of users** • Can be used by managers who have a range of ICT skills and knowledge. **Give information when required** • Timing is critical as there is no point in giving good information after the date it is needed for.	
15.	**Suitable definition of data normalisation, such as:** A staged (mathematical) process (1) which removes repeated groups of data/data duplication 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 database **Suitable definition of a relational database organisation, 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) OR A group of tables linked (1) together by primary and foreign keys (1). **Data warehouse** **1 mark for description involving:** Large, Archive and used for Decision Making – 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) **Data mining** **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. Alternative wording for above might be: • 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. • Is software that 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	2 2 1 1

<table>
<tr><td></td><td>tables and graphs.</td><td></td></tr>
<tr><td>16.</td><td>Any two from:
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</td><td>2</td></tr>
<tr><td>17.</td><td> 

Marking:
• All three correct entities (1)
• Correct relationship between Customers and Bookings (1)
• Correct relationship between Rooms and Bookings (1)</td><td>3</td></tr>
<tr><td>18.</td><td>Benefits (any 2)
• 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 (hotels) 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 hotel’s server.

<table>
<tr><th>Problem</th><th>Solution</th></tr>
<tr><td>Problem hacking into local data
Computers are located on a number of hotel sites so it is important to ensure only authorised users can access the system.</td><td>Can be achieved by using passwords for authorised users, and regularly updating the passwords to increase the levels of security.
NOT just username and password -- needs
something extra</td></tr>
<tr><td>Hacking into/intercepting transmitted data :
Data regularly transmitted between different hotel sites and so data may become corrupt or be tampered with during transmission.</td><td>Checks are put in place in order to ensure that the data that arrives is both secure and accurate.
Encryption of transmitted data.</td></tr>
<tr><td>Viruses if linked to a local database</td><td>Use a <u>firewall and anti-virus software</u></td></tr>
</table></td><td>2

4</td></tr>
</table>

	NOT general problems to do with secure access to computer rooms / natural disasters NOT audit logs NOT firewalls for the protection of transmitted data	