INTRODUCTION

The marking schemes which follow were those used by WJEC for the Summer 2015 examination in GCE ICT. 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.

<table>
<thead>
<tr>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>IT1</td>
</tr>
<tr>
<td>IT3</td>
</tr>
</tbody>
</table>
1.a One mark for each specific use, and advantage

**Use:** e.g.
- Expert using it to find information on network/system configuration
- Writing small batch files (in DOS)

**Advantage:**
- Fast to execute (run)
- Don’t have to go through menu system/faster to enter commands (not type)
- Needs very little overheads (memory/processor)

Not Quick to use

1.b 1 mark for description of any suitable device/method and concrete use, 1 mark for advantage.

Needs to be clear that candidates are describing a use of a device. Advantage must be relevant to use.

Voice control in:
- In-car navigation systems - not brand name – e.g. to plan route.
- Security systems – e.g. to allow entry.
- Control systems – e.g. to control lights in a room.
- Mobile phones – e.g. to dial the phone number of a friend.
- Mobile phones – e.g. to search the network
- Telephone ordering system/appointment systems.
- Doctors can use them to dictate notes directly into a computer.

Student dictating an essay directly into word processing software.

Not just ‘Hands free system in a car’ needs a concrete use

**Advantage:**
- Quicker than typing
- Allows people to enter text directly into a computer without using a keyboard
- Can perform complicated tasks by dictation.
- Can empower disabled.
- Uniqueness of voice print/cannot be used by others
- Lessens risk of RSI
- Safer when driving as hands free doesn’t distract

Advantage must be relevant to use if clear and can be given if mark for use not actually awarded

1.c 1 mark for description of any suitable device and concrete use, 1 mark for advantage.

Needs to be clear that candidates are describing a use of a device. Advantage must be relevant to use.

Joysticks to control a plane in a flight simulator,
- Steering wheels to control a simulation of a car,
- Motion sensors (accelerometers and gyroscopes) and use
- Line of motion sensors (camera tracking motion) and use
- Virtual Reality Interface and use
- Omnidirectional treadmill and use
- Game pads …and use

**Advantage**
- Saves having to type, quicker to enter information/fixed list of options
- Greater realism in the game playing/more interactive
- Greater accuracy/sensitivity/complexity in the movements
- Aids fitness

Not just ‘more fun’ by itself
Any two (description and example) x2
Term need not be there if description is clear what it is about.
No marks just for stating the term.

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

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

Description
Understandable - The meaning of any information should be clear to the user

Examples
- If the information is in a very complicated format then it will waste time and people could
draw the wrong conclusions from it.
- A manager might misunderstand a complex table and order the wrong items.

Encoding is not a viable example

Description
Relevant - Data has to be related to the task you are trying to investigate.

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

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

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

(Time has to be either stated or implied).
NOT Complete or Accurate

© WJEC CBAC Ltd.
2.b. \( (1 \text{ mark for process } 1 \text{ mark for example }) \times 2 \)

NOT aiding the decision making process

**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.
- 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.

**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
- A manufacturer spends money developing a new product because they have seen a gap in the market.

Award process mark if process is clearly described with different words.

---

3. To get full marks there must be at least one advantage and one disadvantage

**Advantages**
- Monitoring e.g. Parents can monitor what their children are using the computer for.
- Parental control of accounts
- Can ensure that the antivirus software is kept up to date on all computers.
- Central software installation e.g. Easier and quicker to install software as it can be done centrally and then shared out to all the computers without physically going to each one. **Not** just ‘can share data/files’.
- Central pool of data/documents e.g. All family members can access data from each other’s computers
- Central backup
- Can all share/control an expensive computer peripherals/Internet access
- Internal email/internal instant messaging if justified

**Disadvantages**
- If virus gets into the system can damage data/programs on all computers very easily
- Security worse as there are more access points and if the hacker gets into one machine can then get into any of the machines.
| 4. | **Query**  
Definition | A query is when you interrogate (search/sort/filter) a database to find some information.  
Use | A search to find all the 'patients who have asthma because they need a flu injection.  
Examples need to indicate **what** looking for and **why** to show whether the query is appropriate.  
**Report**  
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'  
Use | Producing (formatted) lists of patients who have an operation the next day to organise theatre schedules.  
A graph to show blood pressure to compare if it is higher or lower than the previous day.  
A mark for the example can be given if the definition is wrong but their answer involves formatting.  
**Import/export**  
Definition | Import/export – • The ability of a piece of software to read and use the data produced by a different piece of software.  
• Transferring data/information from one piece of software/application to another.  
Use | Exporting names and addresses into a word processing program to produce appointment reminder letters.  
Advantages - each point must be illustrated with a suitable example.  
Must explain the advantage for the first mark and not just give the heading  
**R**epetitive processing - carrying out the same task to the same standard repeatedly (consistency)(1), e.g. Processing the payroll run on a computer for a large organisation.(1)  
**D**ata storage capacity - Millions of records can be physically stored in a very small hard disc (1) so reducing the need to buy or rent office space with many filing cabinets. e.g. all the information about students in a large college will fit on one small hard drive.(1)  
**A**ccuracy (with context) - Calculations are carried out accurately(1), e.g. in a spreadsheet if formula and data are correct then calculations will be correct.(1)  
NOT spell checking or No errors  
**F**aster searching - Records can be found instantaneously,(1) e.g. A company can find a sales transaction amongst its hundreds of thousands when a customer queries a delivery instantaneously.(1)  
**T**he ability to produce different output formats - Information can be produced in tabular or graphical format (1), e.g. a scientist producing a report will include data in a table and to make some of them easier to understand will produce some of them as graphs.(1)  
**E**ase of updating data - Errors in data can be quickly changed without the need to retype everything (1) e.g. if someone changes their address the details can be altered quickly.
without having to re-write the whole record (1)

**Allows predictive analysis** - To gives better management statistics/information to help decision making (1) e.g. analysis of sales patterns will influence choice of stock sent to supermarkets. (1)

**Security policies can be centrally administered / Easier to back up data** - which can be done centrally (1) e.g. Suitable backups can be performed at set times and in one fixed location, e.g. customer orders can be backed up on RAID systems (1)

NOTHING to do with handwriting
NOTHING to do with data entry or collection

List of three gains 1 mark

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>6.</strong> Any two from: (If only 2 listed points 1 mark)</td>
<td>2</td>
</tr>
<tr>
<td>Software - Does the software put a big demand on the system - does it work with other software.</td>
<td></td>
</tr>
<tr>
<td>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</td>
<td></td>
</tr>
<tr>
<td>Communication - Do the different devices talk properly to each other, does the final system fit in what was requested</td>
<td></td>
</tr>
<tr>
<td>Testing - Has the system been checked in all sorts of situations.</td>
<td></td>
</tr>
<tr>
<td>Maintenance procedures - Is there someone whose job is to ensure that the data and software is kept up to date. Proper backups.</td>
<td></td>
</tr>
<tr>
<td>Other factors could involve description of:</td>
<td></td>
</tr>
<tr>
<td>Change in circumstances during development</td>
<td></td>
</tr>
<tr>
<td>Speed of implementation</td>
<td></td>
</tr>
<tr>
<td>Compatibility</td>
<td></td>
</tr>
<tr>
<td>Poor communication with the user</td>
<td></td>
</tr>
<tr>
<td>Abilities of the user</td>
<td></td>
</tr>
<tr>
<td>Post-implementation procedures</td>
<td></td>
</tr>
<tr>
<td>Cost</td>
<td></td>
</tr>
<tr>
<td>Hardware support / reliability</td>
<td></td>
</tr>
</tbody>
</table>

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>7.</strong> Main components (1 mark for a description of each)</td>
<td>3</td>
</tr>
<tr>
<td>1 mark for a list of three components</td>
<td></td>
</tr>
<tr>
<td>Knowledge base -- a collection of rules or other information structures derived from the human expert</td>
<td></td>
</tr>
<tr>
<td>Inference engine -- the main processing element of the expert system/applying rules to the system or situation.</td>
<td></td>
</tr>
<tr>
<td>User Interface -- is the method by which the expert system interacts with a user</td>
<td></td>
</tr>
<tr>
<td>Benefits (Any three)</td>
<td></td>
</tr>
<tr>
<td>- 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</td>
<td></td>
</tr>
<tr>
<td>- The computer does not 'forget' or make mistakes – remembers obscure cases of heart diseases</td>
<td></td>
</tr>
<tr>
<td>- Data can be kept up-to-date e.g. adding more results of radiology scans / constant updating</td>
<td></td>
</tr>
<tr>
<td>- The expert system is always available 24 hours a day</td>
<td></td>
</tr>
<tr>
<td>- Will never 'retire' - No loss of expertise</td>
<td></td>
</tr>
<tr>
<td>- The system can be used at a distance over a network. Therefore rural areas or even poorer third world countries have access to experts</td>
<td></td>
</tr>
<tr>
<td>- Provides accurate predictions with probabilities of all possible problems with more</td>
<td></td>
</tr>
</tbody>
</table>
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

**Drawbacks (Any 2)**
- 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 are from misusing the online version
- Lacks the 'human touch' – lack of personal contact
- Dependent upon the correct information being given. If data or rules are 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 symptoms
- Expert systems can make absurd errors, such as prescribing an obviously incorrect dosage of a drug for a patient whose weight and age are accidentally swapped by the clerk.

**Do not award contradictory answers**

<table>
<thead>
<tr>
<th>Question</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>8.a (i)</td>
<td>A barcode is a series of light and dark bars of differing widths (1) With a code number printed (underneath) (1)</td>
</tr>
<tr>
<td></td>
<td>Made up of country of origin code, manufacturer code, the product code, a check digit. (Any 3) (1)</td>
</tr>
<tr>
<td></td>
<td>(If PRICE included NO mark.)</td>
</tr>
</tbody>
</table>
| 8.a (ii) | **Benefit (1 mark)**  
|          | • Faster to enter data / can read at any angle.  
|          | • More accurate as eliminates typing errors.  
|          | • Low printing costs.  
|          | • Frees staff to do other tasks e.g staff don’t have to manually price goods. |
|          | **Drawback (1 mark)**  
|          | • Can only be used for the input of numbers.  
|          | • Equipment is expensive.  
|          | • Corrupted barcodes can cause delays. |
### 8.b
**Any four of:**

**Processes**
- Code matched on stock database.
- One deducted from stock database / Item sold decreases record by 1.
- if below level automatic request sent to supplier. (computer generated)
- checked / matched / compared against reorder level.
- stock delivered.
- stock database updated.

**Give three benefits and three drawbacks**

#### Benefits (any 3):
- Smaller storage / warehouses needed as not much stock held
- Store is better able to respond to changing demand
- Easier to cope with several small deliveries (less staff) than 1 big one.
- Do not run out of fast selling items
- Less risk of stock being out of date/waste

#### Drawbacks (any 3):
- Expensive to introduce/set up
- More admin staff as store responsible for own ordering
- True stock may differ because of theft, etc.
- Cannot respond to unusual or sudden demand
- Disruption to transport
- Communication failure if qualified (not just ‘internet down / internet failure’)

### 8.c

#### Electronic Fund Transfer at Point Of Sale (1)
**OR:**
- Paying for something, by using a credit/debit card and money is automatically transferred from the customer’s bank account to the shop’s bank account.

#### Advantage for Company
**Any one from:**
- Money taken straight out of customer account so the company is guaranteed it
- Less need for physical security as not have to carry as much cash

**Condone**
- Need for less staff as no need to put price on each item
- Better management statistics / monitoring staff e.g. checkout performance
- Allows better targeting of customers

#### Advantage to customers
**Any one from:**
- Gives the customer many other services i.e. cashback, topping up your phone,
- Allows a variety of payment methods, allows special offers – loyalty cards, BOGOF, vouchers
- Less need for physical security as not have to carry as much cash. **NOT** twice.
<table>
<thead>
<tr>
<th></th>
<th>2 marks for benefits in context and 2 for further explanation.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Automatic recalculation of wages</strong> (1) if data such as rate of pay changes (1)</td>
</tr>
<tr>
<td></td>
<td><strong>Can do what if calculations for options</strong> (1) on staffing or different materials/suppliers (1)</td>
</tr>
<tr>
<td></td>
<td><strong>Can draw graphs for reports</strong> (1) to highlight wages of different departments/compare monthly wage bill (1)</td>
</tr>
<tr>
<td></td>
<td><strong>Accurate calculation of wages/quotes</strong> (1) will increase efficiency/save time (1)</td>
</tr>
<tr>
<td></td>
<td><strong>Setting up templates for quotes</strong> (1) to work quotes out more quickly (1)</td>
</tr>
<tr>
<td></td>
<td><strong>Max 1 for ‘no context’</strong> i.e. two from: ability to recalculate; can show graphically by producing various charts and graphs; accurate calculation, perform ‘what ifs’, set up templates.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>10.a</th>
<th><strong>What (1) and Why (1)</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Examples:</strong></td>
</tr>
<tr>
<td></td>
<td>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).</td>
</tr>
<tr>
<td></td>
<td>I used SINGLE IF in cell E14 on page 5 to work out if the account holders were overdrawn =IF (D2 &lt;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. (Both branches of ‘IF’ for what and why)</td>
</tr>
<tr>
<td></td>
<td>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.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>10.b</th>
<th><strong>What does the macro do (1) and Why (1)</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(i) My macro shown on page 4 defined the special print settings in the Page Setup dialog box(1) so that it printed more quickly as I did not have to set them each time (1)</td>
</tr>
<tr>
<td></td>
<td>(ii) Identify a navigation macro and where is it going to/between (1) this will make it more user friendly / to move backwards and forwards more efficiently/easier/faster (1)</td>
</tr>
<tr>
<td></td>
<td>Macro cannot have functionality already included as part of the system (but could be customisation of a built-in function)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>10.c</th>
<th><strong>What (1) and Why (1) x2</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>One mark for stating method and field, and one mark for benefit. Has to be different for each, e.g.</strong></td>
</tr>
<tr>
<td></td>
<td><strong>List boxes / Combo box</strong></td>
</tr>
<tr>
<td></td>
<td>I used a list box in cell F4 on page 3 to select text from a pre-determined list (on their own example)(1) reducing data entry errors(1) increasing efficiency /speed/ knock on automatic process (1).</td>
</tr>
<tr>
<td></td>
<td><strong>Option or check boxes (Boolean choice).</strong> I used a check box in cell D4 on page 4 to click in the cell for yes/no data placing a tick in the cell (or their own example) (1) increasing efficiency by saving time (1).</td>
</tr>
<tr>
<td></td>
<td><strong>Spinners</strong></td>
</tr>
<tr>
<td></td>
<td>I used a spinner in cell G8 on page 6 using a button (on their own example) (1) to let you see how input changes will alter the outputs in a model (1) so you can see different outcomes more easily (1).</td>
</tr>
<tr>
<td></td>
<td><strong>NOT speed of entry.</strong></td>
</tr>
<tr>
<td></td>
<td><strong>VLOOKUP and variations</strong></td>
</tr>
<tr>
<td></td>
<td>I used Vlookup in cell H14 on page 10 to find the price of the product (1) You can update a table of prices without having to rewrite formulas such as multiple IF statements. / Faster to automatically enter data (1) <strong>Not ‘Error reduction’</strong></td>
</tr>
</tbody>
</table>
10.d  What and why?
No mark for naming a different process but up to two marks for detailed description x2.
Graph, Sort, Search, 3D referencing, etc.
E.g.
I used 3D referencing with four worksheets in my workbook (see pages 9, 10 and 11), so that I could look up similar sales data for each month (1) contained in the different worksheets (1) and composed the results on the summary (1), etc.
Graph: The graph on page 8 showed me how money was spent (1) and it allowed me to work out the break-even (point) (1)
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

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
3. **Uses (Must be different)**
   **Any 2**
   - Used for uploading a database of sales from one branch of the organisation to the head office (1) (Always need to know what the data are)
   - Or to distribute information (on their new sales catalogue) between the company and their customers and suppliers (1)
   - Or Used for down/uploading a website from/onto the internet/server (or a file) (1)
   - Or other relevant example (1) e.g. Transfer files from mac to pc.

   **Must be sure not an internal transfer.**

   **Advantages**
   **Any 2**
   - You are not limited to file size (1)
   - Allows reliable transfer of files between platforms (1)
   - Greater security in transfer of information (1)
   - Can have greater control of remote computer (if well developed). (1)
   - Checking that packets of data have been received correctly (1)
   - Not Just large files
   - Not sending multiple files at once
   - Must be different use to email

4. **Answers should discuss the following factors of the two networks.**
   Any 6 different comparisons but candidates only need to describe one side to get the mark.  
   *Only give cost factors once and knowledge factors once*

<table>
<thead>
<tr>
<th>Peer to peer</th>
<th>Client server</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cost saving</strong> – no server is needed, so all the computers can be the same</td>
<td>More expensive – servers are expensive to buy</td>
</tr>
<tr>
<td><strong>Lower operating costs</strong> – less set up and maintenance costs</td>
<td>Cost of setup and maintenance is higher</td>
</tr>
<tr>
<td><strong>Status</strong> – All machines have same status/rights</td>
<td>One machine more important than the rest</td>
</tr>
<tr>
<td><strong>No network manager is needed</strong> – all users take responsibility for the network (Knowledge)</td>
<td>Need specialist knowledge</td>
</tr>
<tr>
<td><strong>Knowledge</strong> – Users need more IT knowledge</td>
<td>Network manager allocates access to resources on the network</td>
</tr>
<tr>
<td><strong>Easy to set up</strong> – they are the simplest of computer networks, can be set up by anyone</td>
<td>Network operating systems require technical knowledge to set up and maintain</td>
</tr>
<tr>
<td><strong>No reliance on a server</strong> – no worry about the server breaking down</td>
<td>If server breaks down network is unusable</td>
</tr>
<tr>
<td><strong>Peer responsibility</strong> – users decide what resources others can use on their computer</td>
<td>Users need little specialist knowledge as administration is performed centrally</td>
</tr>
<tr>
<td><strong>Security</strong> – Poorer security as resources are shared</td>
<td>Security is better as it is centralised and one persons responsibility (NOT just hierarchy of passwords)</td>
</tr>
<tr>
<td><strong>Back ups</strong> cannot be made centrally – this places the responsibility on all the users to back up their own data</td>
<td>Backups and software installation can be done centrally</td>
</tr>
<tr>
<td><strong>Harder to find files</strong> which are not stored centrally</td>
<td>Centrally stored files are easier to find</td>
</tr>
<tr>
<td><strong>Network size</strong> – Only suitable for very small networks (15 or less)</td>
<td>More efficient / load tolerant for large networks</td>
</tr>
</tbody>
</table>
### 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**

### 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**
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**
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.

**Interviews with managers / 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
- 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

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 software (1).
   Examples: 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).
   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)
<table>
<thead>
<tr>
<th>11.</th>
<th>One mark for discussion of each factor and one for each further explanation/example saying how a company carries out each one x5</th>
</tr>
</thead>
</table>
| **Screening potential employees** | Ensure staff are monitored  
Fit employee to the task  
CRB 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** | Allocating access rights, etc  
Change regularly  
Don’t write it down  
Use upper and lower case mix, etc |
| (expansion would be to do with rules for passwords) |  |
| **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.
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.

Any eight valid points
A well-argued point or detailed example can gain a further mark.
If list of four points max 1 mark.
If list of seven points max 2 marks.
Maximum two marks for repetition of same point
Do not give a rehash of questions

(See some sample answers at end of answers to this question)

<table>
<thead>
<tr>
<th>FACTOR</th>
<th>POINTS</th>
<th>Possible extensions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ownership</td>
<td>Who owns the internet</td>
<td>• Because of the increased commercial value of activities on the internet will a few media giants take control and effectively determine content?</td>
</tr>
<tr>
<td>Ownership</td>
<td>Intellectual property rights-Ownership</td>
<td>• If you put a joke on the Internet do you own it?/If you see a joke on the Internet can you sell that joke to a professional comedian?</td>
</tr>
<tr>
<td></td>
<td>rights to data.</td>
<td>• If you scan in the text of the book ‘The Da Vinci Code’ and put it on the Internet for all to be freely read; are you breaking the law?</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Do the Copyright Laws of one country apply to another country?/ The law of individual countries is beginning to address some of the legal issues such as intellectual property rights on the Internet but laws only apply to the country which passed them.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• International laws may go some way to address misuse of the Internet but this is still a long way off./The growth and exchange of ideas on the Internet has led to many legal disputes and lack of legal clarity as to one’s intellectual property rights.</td>
</tr>
<tr>
<td>Control</td>
<td>Lack of policing</td>
<td>• The lack of ‘policing’ of the Internet also means that the information is not monitored.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Illegal downloading of music / films / action starting to be taken to prosecute.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• In the light of the increase in Internet crime, security scares and increased terrorist activity should the security services be allowed to monitor all Internet traffic.</td>
</tr>
<tr>
<td>Censorship</td>
<td></td>
<td>• There is little control over the content of the material on the Internet, although some governments (China/Burma/North Korea) have started to control what can be seen.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Freedom of speech issues</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Some organisations and countries create blacklist.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Some ISPs ban use of torrent sites</td>
</tr>
<tr>
<td>Hacking</td>
<td>Privacy</td>
<td>Illicit material</td>
</tr>
<tr>
<td>----------------------------------</td>
<td>----------------------------------</td>
<td>-----------------------</td>
</tr>
</tbody>
</table>
| - There is also no control over the people who can access the material on the Internet.  
- It is relatively easy to capture internet traffic.  
- Using someone’s wireless Internet connection without permission.  
- Sometimes it is possible to connect to the Internet using an open network. The net result of using the network is to slow the network down for legitimate users. | - Is censorship an invasion of privacy by governments?  
- Do we have the right to the privacy of our emails and data files?  
- Do we have the right to encrypt our data?  
- Privacy issues – social networking sites, e-commerce sites, Internet service provider records, e-mail monitoring at work, etc., all erode a user’s privacy.  
- Tagging issues - People might see your data /Anyone could see your data you don’t wish to  
- Examples in newspapers of people being *refused employment*, sacked because their social networking sites show them engaging in ‘questionable behaviour’  
- Concerns about the level of safeguarding within social networking sites, as there is no real way of checking who you say you are./Information can also be used for identity theft  
- Some people will say that this is a **valid use of freely available** information;  
- Others may say that this is an **invasion of privacy** and that what you do in your private life is of no interest to your employer.  
- But what if it is a teacher? And it is corrupting the attitudes of their pupils.  
- People do not read their terms and conditions  
- Apply to have private material removed | - 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.  
- Sending spam (i.e., the same advertising e-mail to millions of people) – people waste time deleting spam if the spam filter allows it through. | - Encouraging rioting/revolution  
- Bomb making sites  
- Discrimination of ethnic/minority groups  
- Violent videos |
<table>
<thead>
<tr>
<th>Misuse of Social Media</th>
<th>Control mechanisms</th>
<th>Accuracy</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Increased risk of stalking / Mobile phone stalking/grooming / paedophiles</td>
<td>• The main worry adults have is that young children could accidentally access this material.</td>
<td>• Information is not checked to make sure that it is accurate.</td>
</tr>
<tr>
<td>• Cyber bullying – in chat rooms, by e-mail, in blogs, by text message is a problem especially for the young.</td>
<td>• This means that unless special software (net nanny/ blocking) is used, children can easily gain access to pornographic or violent images /You can set your security settings high</td>
<td>• It is therefore up to the users of the Internet to check the material’s accuracy.</td>
</tr>
<tr>
<td>• Using e-mail to give bad news (e.g. redundancy, demotion, firing, etc.) when explaining face to face would have been better.</td>
<td>• Even with a software filter it is hard to be completely sure material is excluded.</td>
<td>• Plagiarism – copying material without attributing or referencing the source of the information. This could also involve using websites which sell essays or coursework.</td>
</tr>
<tr>
<td>• Deliberately setting up websites containing incorrect or inflammatory information / suicide sites</td>
<td>• If a site is banned it could make it more popular.</td>
<td>• What about plagiarism – if you get thrown out of university because you copied an essay of the Internet</td>
</tr>
<tr>
<td>• Spreading rumours – it is easy to spread rumours using the Internet. You only have to tell a few people in a chat room and the rumour will soon spread. / Spreading lies or malicious rumours. - Trolling</td>
<td>• Throttling back internet access</td>
<td>• Can you sue someone who sells you an essay which is full of factual errors?</td>
</tr>
<tr>
<td>• Normally, if someone started a rumour that was untrue and it caused another person distress, then the person starting the rumour could be sued. / When rumours are started over the Internet it is difficult to identify the person responsible.</td>
<td>• Some ISPs ban use of torrent sites (BUT not twice)</td>
<td>• Some web sites giving medical advice have been known to give wrong information but they are not held liable.</td>
</tr>
<tr>
<td>• Using photo editing software to distort reality and you can no longer believe what you see in video, TV, newspapers, magazines and on websites.</td>
<td></td>
<td>• Magazines can write untrue stories on their websites.</td>
</tr>
<tr>
<td>• The main worry adults have is that young children could accidentally access this material.</td>
<td></td>
<td>• Individuals can spread malicious rumours about people in work related emails and publications. <em>(If not given in misuse of social media; must have a different focus.)</em></td>
</tr>
<tr>
<td>Credit any reasonable answer</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-------------------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sample answers</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Censorship</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No-one owns the Internet. It is international. Material which would be illegal if published in hard copy form is freely available on the Internet e.g. racist propaganda, bomb making instructions, pornography. (1) Some say the Internet should be censored but <strong>who will do the censoring and how can centralised control be implemented</strong>. (1) If you ban sites will they become more appealing so people will search for them more avidly.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>MAX 2 marks for same point</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Accuracy</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>There is no guarantee that any information on the Internet is accurate or true. (1) Some web sites giving medical advice have been known to give wrong information but they are not held liable. (1) Magazines can write untrue stories.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>MAX 2 marks for same point</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Privacy</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>It is relatively easy to capture internet traffic. (1) Do we have the right to the privacy of our emails and data files? (1) Do we have the right to encrypt our data?</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>MAX 2 marks for same point</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
13. **Answers must be sentences and not a list.**

*Consequences must match threats. List of consequences 1 mark.*

*List of threats 1 mark.*

**Note:** Hacking and viruses are not a threat in themselves. Inserting a virus to deliberately destroy data is sabotage. Hacking to take data is theft.

**Must have three different consequences for customers or company.**

*No mark for prevention*

<table>
<thead>
<tr>
<th>Threat</th>
<th>Example</th>
<th>Consequence (could be interchangeable)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Terrorism</td>
<td>Cyber attacks to slow down or prevent online services</td>
<td>Loss of reputation</td>
</tr>
<tr>
<td>Criminal vandalism/sabotage</td>
<td>Attacks on firewalls by viruses to destroy data</td>
<td>Loss of business and income</td>
</tr>
<tr>
<td></td>
<td>Deliberate destruction of the physical data</td>
<td>Legal action</td>
</tr>
<tr>
<td>Theft by Hacker/employee (White collar crime)</td>
<td>Hacking into data to steal company private details Or\copying company records onto disc and selling it to rivals / and misuse it for own purpose</td>
<td>Costs of recovering data</td>
</tr>
<tr>
<td>Natural disasters</td>
<td>Floods, earthquakes</td>
<td></td>
</tr>
<tr>
<td>Accidental altering of data</td>
<td>Overwriting files: accidental deletion of files</td>
<td>Legal action</td>
</tr>
<tr>
<td>Theft of data</td>
<td>Stealing storage media containing data</td>
<td>Loss of business and income</td>
</tr>
<tr>
<td>Fire</td>
<td>Electrical fire in server room</td>
<td>Bankruptcy</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Cost of new hardware</td>
</tr>
</tbody>
</table>
14. **1 mark for factor and second mark for good example or expansion x4**

**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**

16. **Any two from:**

- Hierarchy of passwords - passwords to see separate parts
- Storage of data separate to programs
- Access rights to parts of the program

**NOT** ‘cannot delete linked tables’
17. **Advantage of data warehouse (any 1 of)**  
- Allows the organisation to store information about every sale. (1)  
- Allows the organisation to see who has bought what items and when. (1)  
- Can use it to plan future changes or developments in their business. (1)  
- Allows the organisation to use data mining. (1)  
- Allows the organisation to find the most popular product (1)  
- Allows the organisation to see who has bought what items (1)  
- Allows the organisation to target customers with special offers (1)

**Advantage of data mining**  
Up to two marks for advantage  
Examples worth 1 mark:  
Can provide:  
- The organisation with a list of customers likely to buy a certain product, which they can then use to target with a mail shot.  
- Comparisons with competitors  
- Useful ‘what if’ results from modelling exercises  
- Predictions for future sales  
- Analysis of best sites for shops  
- Analysis of sales patterns  
- Returned information can be tested for plausibility.  
- Data if of value can be processed into a report to help decision making.

Examples worth 2 marks: (What and Why) - (Why is new knowledge)  
- Fighting shoplifting in clothing stores – Jaeger used DM to look at transactions and position of item in store (1) – found even with tags most items stolen near doors –led to increased CCTV, more prosecutions and recovery of goods.(1)  
- Analyse buying patterns / Identification of customer needs – Virgin Media use DM to segment and target customers (1) most likely to buy new services or upgrades. (1)  
- Could allow organisation to find a previously unknown relationship between regions of the country and food preferences (1) and they can then target special promotions. (1)

The difference here is that the why will refer to a new connection between the data or a new conclusion.
18. **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>
<thead>
<tr>
<th>Problem</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Problem hacking into local data</td>
<td>Can be achieved by using passwords for authorised users, and regularly updating the passwords to increase the levels of security.</td>
</tr>
<tr>
<td>Computers are located on a number of hotel sites so it is important to ensure only authorised users can access the system.</td>
<td><strong>NOT</strong> 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 firewall and anti-virus software</td>
</tr>
</tbody>
</table>

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