



## **Cambridge National ICT**

**Unit R001/01: Understanding Computer Systems**

Cambridge National Level 1/2 Certificate

### **Mark Scheme for January 2016**

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This mark scheme is published as an aid to teachers and students, to indicate the requirements of the examination. It shows the basis on which marks were awarded by examiners. It does not indicate the details of the discussions which took place at an examiners' meeting before marking commenced.

All examiners are instructed that alternative correct answers and unexpected approaches in candidates' scripts must be given marks that fairly reflect the relevant knowledge and skills demonstrated.

Mark schemes should be read in conjunction with the published question papers and the report on the examination.

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These are the annotations, (including abbreviations), including those used in scoris, which are used when marking

1	<b>BOD</b>	BOD	Benefit of doubt
2	<b>X</b>	Cross	Cross/Incorrect
3	<b>REP</b>	REP_BIG	Repetition
4	<b>SEEN</b>	SEEN	Noted but no credit given
5	<b>✓</b>	Tick	Tick
6	<b>TV</b>	TV	Too vague
7	NBOD	NBOD	Benefit of doubt not given
8	FT	FT	Follow though
9	FA	FA	First Answer
10	NAQ	NAQ	Not answered question
11	FTX	FTX	Follow through wrong
12	L1		Level 1
13	L2		Level 2
14	L3		Level 3

Question		Answer/Indicative content	Mark	Guidance
1	a	<p>Up to TWO marks for a full description: e.g.</p> <ul style="list-style-type: none"> <li>• No need for a computer/digital device (1) so can be completed immediately/so no need to provide a dedicated machine/may be more accessible (1)</li> <li>• Can be completed anywhere/in the practice/at home (1) so space not wasted in practice (1)</li> <li>• Patients may not read English/some people may not be able to use computer (1) can take it away to get help/paper is more acceptable (1)</li> </ul>	2	<p>Answer may be a benefit to customer OR the practice.</p> <p>Benefit MUST be a benefit of using a paper based form, rather than a benefit of having the data itself.</p> <p>DO NOT accept “quicker/easier” on its own, however “submitted more quickly” is acceptable.</p>
1	b	<p>TWO marks for one complete description: e.g.</p> <ul style="list-style-type: none"> <li>• Paper can be lost/damaged (1) and so data will be lost (1)</li> <li>• People may be ill (1) so handwriting may be poor (1)</li> <li>• Handwriting may be poor (1) and so answers will be illegible (1)</li> <li>• It will take time (1) to enter the data manually (1)</li> <li>• Handwriting can be hard to read (1) and so data may be misread (1)</li> </ul>	2	<p><b>MUST be a disadvantage to the practice.</b></p> <p>Must be an issue <b>plus</b> an expansion for two marks to be awarded.</p> <p>Answers must be about the process of COLLECTING data.</p>
1	c	<p>ONE from:</p> <ul style="list-style-type: none"> <li>• Scanner (1)</li> <li>• (Digital) camera (1)</li> <li>• Optical character <u>reader</u> (1)</li> </ul>	1	<p>Do NOT accept mobile phone/tablet/photocopier etc <b>alone</b> as an answer, as the device is a camera. However accept answers where the expansion is qualified.</p> <p>DO NOT accept “computer” on its own.</p>
2	a	<p>TWO marks available: e.g.</p> <ul style="list-style-type: none"> <li>• Keyboard (1)</li> <li>• Touch screen (1)</li> <li>• Mouse (1)</li> <li>• Microphone (1)</li> <li>• Scanner (1)</li> </ul>	2	<p>Accept equivalent answers.</p> <p>Scenario states that data will be added to a database. Therefore, method must suit the process of adding data to a database for use.</p>

Question		Answer/Indicative content	Mark	Guidance
2	b	Monitor/screen/touchscreen (1)	1	Other answers, such as projector, would not be appropriate, as would not fit the scenario.
2	c	<p>Up to two marks for a full explanation: e.g.</p> <ul style="list-style-type: none"> <li>• Form can be laid out in the same order as the questionnaire (1) so that data entry clerk does not get confused (1)</li> <li>• Logical layout of form (1) so that data makes sense (on entry) (1)</li> <li>• Form can include labels/tips (1) to give explanations (1)</li> <li>• Form automatically selects next field (1) saves people from doing this manually (1)</li> <li>• The form can have (types of) fields (1) that allows data validation (1)</li> </ul>	2	<p>Answers must refer to process of adding data, rather than viewing information.</p> <p>DO NOT accept “faster” or “easier” without expansion eg it would be easier/faster to enter details (1).</p> <p>DO NOT accept answers to do with formatting of data to be collected – this would be set by the database, not the form.</p>
2	d	<p>Up to TWO marks for a full description:</p> <ul style="list-style-type: none"> <li>• Queries identify records (1) that fit a criteria (1)</li> <li>• Can search (1) for individual patients (1)</li> <li>• Can search for information (1) by selecting relevant fields (1)</li> <li>• Queries are done by software (1) so each record does not need to be checked individually (1)</li> <li>• <u>Searches very quickly</u> (1) manual checks would take more time (1)</li> <li>• <u>Data can be easily separated</u> (1) and sorted (1)</li> </ul>	2	<p>Do not accept easier.</p> <p>Do not accept quicker, unless it clearly refers to speed of searching.</p>

Question		Answer/Indicative content	Mark	Guidance
3	a	<p>Up to THREE marks:</p> <p>e.g.</p> <ul style="list-style-type: none"> <li>• All computers are connected (1) by using the same broadband router (1) so users could access practice data (1)</li> <li>• Unable to restrict the devices that can connect to the network (1) and the software that is on them (1) Plus suitable expansion (1)</li> <li>• Unrestricted access/hacking/hackers (1) to the network/to patients' files (1) for unknown devices (1) can't control what they do (1)</li> <li>• Virus (1) which gets into patients records (1) and deletes them/breaks Data Protection Act (1)</li> </ul>	3	<p>Must be ONE coherent answer for full marks.</p> <p>Question is about <b>why</b> the network is less secure. Accept "hacking" on its own as an answer.</p> <p>The answers given here are examples and DO NOT define the acceptable structure.</p> <p>Identify (1) what happens (1) implication (1)</p>
3	b	<p>Up to TWO marks:</p> <p>e.g.</p> <ul style="list-style-type: none"> <li>• Physically separate (1) into <u>two</u> networks (1)</li> <li>• Use a separate broadband (1) for wifi and office work (1)</li> <li>• Use a switch/router (1) to create a VLAN (1)</li> <li>• Have two networks (1) with a firewall (between) (1)</li> <li>• Have passwords (1) to access the wifi (1)</li> <li>• Create password (1) that is changed regularly (1)</li> <li>• Encrypt the data (1) so if someone located a file they could not understand it (1)</li> </ul>	2	<p><b>Answer MUST be a method.</b></p> <p>Award two marks for a full description.</p> <p>Do not accept answers to do with virus protection, as this is already in place.</p>

Question		Answer/Indicative content	Mark	Guidance
4	a	<p>Up to TWO marks:</p> <p>e.g.</p> <ul style="list-style-type: none"> <li>• Backup takes a lot of processing power/slow down the system (1) and so back up is done when computers are not being used/network traffic is reduced/not many users are logged on (1)</li> <li>• Fewer users at night (1) (so) fewer changes happening (1) backup is more likely to capture all/most data changes made (1)</li> <li>• Backup up is more likely to capture all/most changes made (1) that day (1)</li> <li>• Computers are in constant use in the day (1) backup would slow down the work rate (1)</li> </ul>	2	<p><b>Must be ONE coherent answer for full marks.</b></p> <p>DO NOT award more than ONE mark unless there is an attempt at an explanation.</p> <p>“Back up takes a long time and so is done at night” - TV</p> <p><b>Answer must be an explanation of why backup occurs <u>at this time</u> and NOT why backup occurs.</b></p>

Question		Answer/Indicative	Marks	Guidance	
				Content	Levels of response
4	b	<p>Candidate may consider:</p> <ul style="list-style-type: none"> <li>• Access: <ul style="list-style-type: none"> <li>○ Fast access to local drives</li> <li>○ Slower access to the cloud</li> <li>○ Access to the cloud is dependent on access to the Internet</li> </ul> </li> <li>• Control <ul style="list-style-type: none"> <li>○ You control the data/hard drives on a local back up</li> <li>○ The backup location on the cloud is unknown</li> <li>○ The backup machines on the cloud are not in your control</li> </ul> </li> <li>• Theft <ul style="list-style-type: none"> <li>○ Risk of theft of actual drive</li> <li>○ Other business is responsible for security when stored on the cloud</li> </ul> </li> <li>• Hard drive failure/Fire and other accidental events <ul style="list-style-type: none"> <li>○ One hard drive typically used or back up</li> <li>○ Mirrored storage on the cloud</li> </ul> </li> </ul>	8	<p><b>A clearly argued answer, based on description, evidence and reasoning:</b></p> <p>Local storage uses hard drives attached to the practice's system. These hard drives can be removed at the end of the backup process and stored in a different location. Cloud storage uses servers which are in the cloud, which means that they are servers based somewhere else, and which are accessed via the internet. The cloud is the better system because it is based somewhere else so that the servers are safe from a fire or local disaster, so that the data is unlikely to get damaged in a local event that may also affect removable hard drives. Also, using this method means that the Office Manager does not need to remember to take the disks away, as the data is automatically stored elsewhere.</p> <p><b>A weakly argued answer, with reasonable descriptions, some evidence and fair reasoning</b></p> <p>Both local storage and cloud storage can be used to back up data that is held on the Practice's system. Both</p>	<p><b>LEVEL Three (7–8 marks)</b></p> <p><u>The use of cloud storage and removable hard drives will be compared for backup.</u></p> <p>The candidate will explain, with more than one reason, why the chosen method is suitable <b>for backup</b>.</p> <p>Reasons are based on the comparison.</p> <p>All answers must be in context.</p> <p>Specialist terms will be used correctly and appropriately.</p> <p>At the bottom end of the mark range, the candidate may only explain one reason why the chosen method is suitable, or may provide a fairly weak explanation of more than one reason.</p> <p><b>Level 2 (4–6 marks)</b></p> <p>The use of cloud storage and removable hard drives will be compared. <b>At the top of the mark band</b> the answer will be in context.</p> <p>The candidate will identify their preferred location/medium and will have described reasons why they have made their</p>

Question		Answer/Indicative	Marks	Guidance	
				Content	Levels of response
		<ul style="list-style-type: none"> <li>• Cost:           <ul style="list-style-type: none"> <li>○ Hard drive costs are linked to the size of the storage</li> <li>○ Online storage costs are linked to services provided and features</li> <li>○ No leased lines</li> <li>○ Reducing telephone call charges</li> <li>○ Reduced maintenance costs</li> </ul> </li> </ul>		<p>systems use computers to back up to, but the cloud storage computers are not in the building. Both systems of backup are useful, as both would survive a fire. The removable hard drive is the better option because it is less likely to be damaged.</p> <p><b>A poor description</b></p> <p>Cloud back up is held in the cloud. Local back up is held on a hard drive. The hard drive can be removed.</p>	<p>choice. There may be some attempt at an explanation, but this will be weak.</p> <p>At the bottom end of the mark band, there will be a good description of either location/medium. This may not be in context. The candidate may not have explicitly identified their chosen location/medium, but it should be possible to infer which is being chosen. There will be some reasons weakly described.</p> <p>Specialist terms will be used appropriately and for the most part correctly.</p> <p><b>Level 1 (1–3 marks)</b></p> <p>At the top of the mark band, there will be a poor description of one method. This may simply be a list of points about the method, rather than a structured comment.</p> <p>There will be no use of specialist terms.</p> <p>At the bottom end, simply identifying one area of consideration is worth 1 mark.</p> <p><b>Zero marks</b></p> <p>Answers with no valid content.</p>

## SECTION B

Question	Answer/Indicative content	Mark	Guidance
5	<p>TWO marks for <b>each</b> explanation. Max 4 marks.</p> <p><b>Advantage: MAX 2</b></p> <p>e.g.</p> <ul style="list-style-type: none"> <li>• The details can be checked/can get feedback (1) to make sure that they are understood (1)</li> <li>• Message can be received anywhere (1) because the phone is mobile (1)</li> <li>• The message will get to the doctor quickly (1) so that they will be able to respond (1)</li> </ul> <p><b>Disadvantage: MAX 2</b></p> <p>e.g.</p> <ul style="list-style-type: none"> <li>• The phone may be engaged/out of signal/out of charge/left in the car etc (1) and so call is not received/have to check voice mail etc (1)</li> <li>• Doctor may be busy/driving (1) and so call cannot be answered (1)</li> <li>• Private data could be overheard (1) if a third party is close (1).</li> <li>• If have to use voice mail (1) can't check understanding (1)</li> <li>• Not heard correctly by the doctor (1) as voice unclear (1)</li> <li>• Verbal information may be forgotten (1) and so would have to call back (1)</li> </ul>	4	<p><b>The question is about the use of verbal communication on a phone.</b></p> <p>Therefore answers may refer to using phones in general, OR issues to do with mobile phones.</p>

Question		Answer/Indicative content	Mark	Guidance
6	a	<p>ONE from:</p> <p>e.g.</p> <ul style="list-style-type: none"> <li>• Allows application software to run (1)</li> <li>• Manages hardware and software (1)</li> <li>• Provides user interface (1)</li> <li>• Enables IPSO (1)</li> <li>• Allows navigation/search through files (1)</li> </ul>	1	<p>Emphasis is on operating system performing basic functions therefore do not award complex functions such as routine maintenance.</p>
6	b	<p>UP to two marks:</p> <p>e.g.</p> <ul style="list-style-type: none"> <li>• To store/hold (1) files/data/programs (1)</li> <li>• To save (1) work (1)</li> </ul>	2	<p>Award two marks for a full description</p> <p>Do not accept 'allow access/view to files' as question refers to storage.</p>
6	c	<p>TWO marks available:</p> <p>e.g.</p> <ul style="list-style-type: none"> <li>• <u>Capital</u> letters (1)</li> <li>• <u>Lowercase</u> letters (1)</li> <li>• Numbers (1)</li> <li>• <u>Special</u> characters (1)</li> <li>• Suitable minimum length of x, where x minimum of 6(1)</li> <li>• Use a combination of types of characters (1)</li> <li>• Not an obvious word or phrase (accept examples such as password) (1)</li> </ul>	2	<p>This question is asking for practical understanding of what is included in a strong password.</p> <p>Types of characters includes numbers.</p> <p>Candidate is free to state a suitable minimum length (however minimum 6).</p> <p>Password must be long - mark as TV</p> <p>Password must be complex – mark as TV</p> <p>Password must not be related to yourself – mark as TV</p>

Question		Answer/Indicative content	Mark	Guidance
6	d	<p>Up to THREE marks: e.g.</p> <p><b>Access protection</b></p> <ul style="list-style-type: none"> <li>• USB security key is a piece of hardware (1)</li> <li>• Provides an <u>extra layer/level</u> of security (or equivalent) (1)</li> <li>• Protects (laptop) computer/info on computer (1)</li> <li>• From unauthorised access/only the person with the key has access (1)</li> <li>• Provides authentication (1)</li> <li>• Holds digital signature (or equivalent) (1) digital signature is compared to that required (1) access is denied if it does not match (1)</li> <li>• Unencrypts data (1) held on laptop (1)</li> <li>• Without security key (1) data is encrypted (1) and so can't be read (1)</li> <li>• Without security key (1) operating system will not start (1) so data is protected/cannot use computer (1)</li> <li>• Laptop will not work (1) if key is not inserted (1) so data is protected (1)</li> </ul>	3	<p>Answer may be given in a range of ways. Read the whole answer and award to the candidate's best advantage.</p> <p>Answer must refer to security.</p> <p>Do not award 'more secure'.</p> <p>MAX two marks if there is no attempt at an explanation (for example, if there are individual points made, but with no attempt to explain how these are important).</p> <p>Accept non-technical answers eg</p> <p>Can keep the key with her at all times, so only she can log into her computer (1) the key is unique (1) a hacker could find out her password but without getting the key they would not be able to get into her laptop (1)</p>
7	a	<p>Up to TWO marks:</p> <ul style="list-style-type: none"> <li>• All computers are protected (1) on the whole of the network (1)</li> <li>• To protect a computer (1) from malicious software/malware/virus (1) To detect (stop/remove/and block) (1) malicious software/malware/virus (1) If virus was on a computer (1) personal information could be stolen/damaged/corrupted (1)</li> </ul>	2	<p>Answer MUST be a description of the benefit of anti-virus software.</p> <p>Award up to two marks for a full description.</p> <p>Do not accept virus on its own</p>

Question		Answer/Indicative content	Mark	Guidance
7	b	<p>Up to TWO marks:</p> <ul style="list-style-type: none"> <li>• It updates itself (1) plus expansion (1)</li> <li>• Office Manager may forget to update (1) and so get attacked by new virus (1)</li> <li>• Automation means that user does not need to remember (1) so one less task (1)</li> <li>• Office manager is busy (1) (and so) Office Manager may forget (1)</li> <li>• It will save time/it is quicker <u>than doing it manually (or equivalent)</u> (1) because the Office Manager only has to set it once (1)</li> </ul>	2	<p>Answer MUST show an awareness of the benefits of automated updates over manual for FULL marks to be awarded.</p> <p>Answers to do with updating anti-virus software which do not clearly deal with the automation may be awarded a maximum of ONE mark.</p> <p><b>DO NOT accept second level answers, such as “Office Manager may be sacked” type answers.</b></p>
7	c	<p>(i) Up to TWO marks:</p> <p>e.g.</p> <ul style="list-style-type: none"> <li>• Makes files contiguous/links parts of files together (1) so that she can open files more quickly/computer speed increases (1)</li> <li>• To minimise head travel time/reduce system start up times (1) so that she can open files more quickly (1)</li> <li>• Improve the performance of the computer (1) by speeding up data access (1)</li> <li>• Reduces system start up times (1) by speeding up data access (1)</li> </ul>	2	DO NOT accept answers to do with increased storage space.

Question		Answer/Indicative content	Mark	Guidance
7	c (ii)	<p>Up to 6 marks available, awarded in TWO blocks of THREE</p> <p>Identify system tool (FIRST MARK) (1) Describe the system tool (2)</p> <p>e.g.</p> <ul style="list-style-type: none"> <li>• <b>Disk Cleanup (or equivalent)</b> (1) (first mark)</li> <li>• To free up disk space (1) by removing unnecessary files (1)</li> <li>• To reduce (1) the number of unnecessary files (1)</li> <li>• <b>System restore (or equivalent)</b> (1) (first mark)</li> <li>• To take the computer back (1) to a previous configuration (1)</li> <li>• Undo (1) system changes (1)</li> <li>• <b>Memory diagnostic (or equivalent)</b> (1) (first mark)</li> <li>• Restart the computer (1) and look for memory defects (1)</li> <li>• <b>Resource monitor (or equivalent)</b> (1) (First mark)</li> <li>• To check which resources (1) are using the system (1)</li> <li>• <b>Task scheduler (or equivalent)</b> (1) (First mark)</li> <li>• Can view and change (1) when set tasks occur (1)</li> <li>• Action Centre (1) (First mark)</li> <li>• which is a program preinstalled (1) that tells you about your backups, your firewall and other privacy settings. (1)</li> <li>• <b>Update Manager</b> (1) (First mark)</li> <li>• to check to see if the computer has any new updates (1) reducing the vulnerabilities in the system (1)</li> </ul>	6	<p><b>DO NOT award marks for defragmentation.</b></p> <p>A system tool is anything that comes with the operating system, but must be used to maintain. Accept any reasonable system tool that could be used for maintenance, including breakdown or computer failure.</p> <p>Where a candidate does not correctly identify the system tool, no further marks may be awarded for the description</p> <p>Award two marks for a full description. Full description may be two individual, linked points OR one point, with an expansion.</p> <p>Do not accept:</p> <p>Anti virus Firewall Backup Software update on its own –must be Operating System Update</p>

Question		Answer/Indicative content	Mark	Guidance
8	a	<p>e.g.</p> <ul style="list-style-type: none"> <li>• So that the patient knows what the form is for (1)</li> <li>• So that the user knows the information that is needed (1)</li> </ul>	1	Answer MUST be the purpose of the feature – this is what the feature achieves by being on the online form.
	b	<p>Up to TWO marks:</p> <p>e.g.</p> <ul style="list-style-type: none"> <li>• Select answers from existing list (1) speeds up data entry/ fewer mistakes (1)</li> <li>• Restricts options (1) makes the database easier to search (1)</li> <li>• Displays a list of items (1) which forms data validation (1)</li> </ul>	2	
8	c	<p>Answers may include</p> <p>e.g.</p> <ul style="list-style-type: none"> <li>• Radio buttons can be a closed list (1) but text boxes allow the user to say what they want (1)</li> <li>• The information in radio buttons can be validated (1) because it is a prewritten list (1), but the information in text boxes cannot (1) as anything can be entered. (1)</li> <li>• Radio buttons can collect opinions (1) so can text boxes (1) such as Yes/No (1) and free comments (1).</li> <li>• Radio buttons could be used to select one option (1) as it gives a closed list. (1) Text boxes could be used to type into (1) allowing more information to be included. (1)</li> </ul>	4	<p>For full marks accept a comparison plus example of each side.</p> <p>Comparison may result in the candidate pointing out that the two items are the same.</p> <p>Accept two individual points about either side where they form a comparison.</p>
8	d	<p>Up to TWO marks for ONE description:</p> <p>e.g.</p> <ul style="list-style-type: none"> <li>• Send the form/data (1) to the practice (1)</li> <li>• Performs a presence check (1) and asks for any missing data (1)</li> <li>• Ask you if you are sure (1) before it is sent (1)</li> </ul>	2	<p>Answer MUST be the purpose of the feature – this is what the feature achieves by being on the online form.</p> <p>Only accept answers to do with the process of transmitting/sending data/form. DO NOT award marks for submit/submission/submitted as this is a repeat of the question.</p>

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