

Name:

Class Teacher:

Date:



OCR J276

GCSE Computer Science

REVISION BOOKLET – MARK SCHEME

1.8 ETHICAL, LEGAL, CULTURAL AND ENVIRONMENTAL CONCERNS

Content in J276 GCSE Computer Science:

- 1.1 Systems Architecture
- 1.2 Memory
- 1.3 Storage
- 1.4 Wireless and Wired Networks
- 1.5 Network Topologies, Protocols and Layers
- 1.6 System Security
- 1.7 Systems Software
- 1.8 Ethical, Legal, Cultural and Environmental Concerns
- 2.1 Algorithms
- 2.2 Programming Techniques
- 2.3 Producing Robust Programs
- 2.4 Computational Logic
- 2.5 Translators and Facilities of Languages
- 2.6 Data Representation

EXAM QUESTIONS

QUESTION 1

A law firm currently use a Local Area Network (LAN) linked to a Wide Area Network (WAN). **Fig 3** lists some actions that may take place in the law firm's office. Tick **one** box in each row to show which legislation applies to each action.

		Data Protection Act 1998	Computer Misuse Act 1990	Copyright Designs and Patents Act 1988		
1	Using a picture for the law firm's new logo without the original creator's permission			✓	1 mark for each tick in the correct box. 0 marks for a row with more than one tick.	
	A secretary accessing a lawyer's personal email account without permission		✓	6		
	Making a copy of the latest Hollywood blockbuster movie and sharing it with a client			✓		
	Storing customer	✓				

data insecurely					
A lawyer installing a key logger on the secretary's computer		✓			
Selling client's personal data to a marketing company without their permission	✓				

QUESTION 2

Even though the computer devices they own still work, people often want to buy the most up-to-date models, such as the latest smartphone. Discuss the impact of people wanting to upgrade to the latest smartphone. In your answer you might consider the impact on stakeholders, technology, ethical issues and environmental issues.

		<p>Mark Band 3-High Level (6-8 marks)</p> <p>The candidate demonstrates a thorough knowledge and understanding of a wide range of considerations in relation to the question; the material is generally accurate and detailed. The candidate is able to apply their knowledge and understanding directly and consistently to the context provided. Evidence/examples will be explicitly relevant to the explanation. The candidate is able to weigh up both sides of the discussion and includes reference to the impact on all areas showing thorough recognition of influencing factors.</p> <p><i>There is a well-developed line of reasoning which is clear and logically structured. The information presented is relevant and substantiated.</i></p> <p>Mark Band 2-Mid Level (3-5 marks)</p> <p>The candidate demonstrates reasonable knowledge and understanding of a range of considerations in relation to the question; the material is generally accurate but at times underdeveloped. The candidate is able to apply their knowledge and understanding directly to the context provided although one or two opportunities are missed. Evidence/examples are for the most part implicitly relevant to the explanation. The candidate makes a reasonable attempt to discuss the impact on most areas, showing reasonable recognition of</p>	8	<p>The following is indicative of possible factors/evidence that candidates may refer to but is not prescriptive or exhaustive:</p> <p>Indicative Content:</p> <p>Stakeholders</p> <ul style="list-style-type: none"> • Can adversely affect people in this country and abroad: <ul style="list-style-type: none"> ○ health issues ○ financially ○ socially ○ culturally • The phone manufacturers • The phone shops/networks <p>Technology</p> <ul style="list-style-type: none"> • The type of devices that are disposed of • Modern phones poorly designed for durability • Phones hardware not upgradeable/replaceable • Proprietary technology used by some manufacturers <p>Environmental</p> <ul style="list-style-type: none"> • Reference to e-waste (people dispose of their devices in landfill even if they are in good working order) • Some equipment is also sent abroad to be disposed of • Leads to excessive landfill (in this country) 	
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		<p>influencing factors. <i>There is a line of reasoning presented with some structure. The information presented is in the most part relevant and supported by some evidence.</i></p> <p>Mark Band 1-Low Level (1-2 marks)</p> <p>The candidate demonstrates a basic knowledge of considerations with limited understanding shown; the material is basic and contains some inaccuracies. The candidate makes a limited attempt to apply acquired knowledge and understanding to the context provided.</p> <p>The candidate provides nothing more than an unsupported assertion.</p> <p><i>The information is basic and communicated in an unstructured way. The information is supported by limited evidence and the relationship to the evidence may not be clear.</i></p> <p>0 marks</p> <p>No attempt to answer the question or response is not worthy of credit.</p>		<p>and/or abroad, e.g. Africa and Asia)</p> <ul style="list-style-type: none"> ● Toxic waste released into land, ground water, air (in this country and/or abroad, e.g. Africa and Asia) ● Waste of resources Precious metals in phones <p>Ethical Issues</p> <ul style="list-style-type: none"> ● Contributes to ill health ● Contributes to the digital divide ● Contributes to social divide ● Problem of confidential data stored on the devices ● Puts social pressure on parents to pay for their children to upgrade ● Puts social pressure on the public to upgrade ● Can lead to bullying of those who cannot afford the latest technology ● Phone manufacturers intentionally designing fragile phones so they need to be replaced more often ● High cost of new devices. 	
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QUESTION 3

The accident and emergency department of a hospital uses a computer system to decide the order in which patients are treated. Describe advantages of using a computer system instead of a person to decide the order, and the need for this system to be reliable. The quality of written communication will be assessed in your answer to this question.

3		<p><i>Points may include:</i></p> <p>Advantages</p> <ul style="list-style-type: none"> • Computer system is more systematic than human... will not forget some patients / give consistent results • Software can be deployed in several departments • Easier to analyse records and measure the performance of the hospital. <p>Reliability</p> <ul style="list-style-type: none"> • Critical application, lives may be at stake if there are errors in the program • Loss of data / loss of power or any system down time can have adverse effects. 	<p>High Level Response (5–6 marks)</p> <p>A good understanding with detailed descriptions of both advantages and the need for reliability. There will be few if any errors in spelling, grammar and punctuation. Technical terms will be used appropriately and correctly.</p> <p>Medium Level Response (3–4 marks)</p> <p>A description of some advantages of the system and the need for reliability but one may be limited. There may be occasional errors in spelling, grammar and punctuation. Technical terms will be mainly correct.</p> <p>Low Level Response (1–2 marks)</p> <p>There may be an attempt to describe the advantages or the need for reliability but this is vague and some of the statements made are inaccurate. Information will be poorly expressed and there will be a limited, if any, use of technical terms. Errors of grammar, punctuation and spelling may be intrusive.</p> <p>Examiner's Comments</p> <p>This question gave a good spread of marks as was expected, although we would have liked to see marginally more answers in the high level band. This was an open ended question where candidates were expected to apply principles they have learnt on the impact and reliability of modern applications of computing in a relatively familiar but probably unrehearsed context, so that their ability to reason</p>	
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					<p>around the material they have studied can be assessed. Most candidates gave a reasonable, and often good, account of the advantages of using a computer system instead of people in this scenario but did not give an equally reasonable account of the importance for such a system to be reliable. In many cases, this is what prevented some able candidates from achieving a high level mark.</p>	
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QUESTION 4

A school uses off the shelf, proprietary software for managing pupils' attendance, and customised, open source software for managing pupils' examinations. Describe the difference between proprietary and open source software.

4	a	<ul style="list-style-type: none"> • Proprietary software cannot be copied / altered (without permission of the copyright owner) • Open source software can be modified (provided it remains open source) • Proprietary software is distributed only as a compiled program / source code not available • Open source software is distributed with its source code. <p>Mark in pairs</p>	2	<p>Not cost / free</p> <p>?Examiner's Comments</p> <p>??</p> <p>This part was a little disappointing. The question asked candidates to give the fundamental differences between the types of software given, and instead candidates listed everything they knew about them in particular their relative benefits and disadvantages (and often not the crucial fundamental difference). It was sufficient to say that open source licences require that source code be made available while proprietary software restrict the availability and public use of sort code. We still have several candidates who write that the difference is that open source software is free of charge – this is true of a lot of proprietary software.</p>	
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Explain the legal issues that a school should consider when choosing the software for managing pupils' attendance and examinations. The quality of written communication will be assessed in your answer to this question.

b		<p>Points may include:</p> <ul style="list-style-type: none"> • Must abide by software licence • So for open source, the school will be able to make modifications / customisations to exams system • But will probably have to make these modifications also available to other users • And credit all previous contributors in the code • Will have to purchase off the shelf attendance package legally • Software must be able to ensure all legal data protection requirements are met. 	6	<p>Candidates are most likely to discuss copyright issues to do with software licensing and / or data protection issues to do with pupils' personal data. Consider any relevant legal issues. It is the quality of discussion, not the breadth of issues that determines the level (eg it is possible to score a high level mark with a detailed description of copyright issues only).</p>	<p>High Level Response (5–6 marks)</p> <p>A detailed description of legal issues linked to the scenario in the question. There will be few if any errors in spelling, grammar and punctuation. Technical terms will be used appropriately and correctly.</p> <p>Medium Level Response (3–4 marks)</p> <p>A description of legal issues and an attempt to link this to the scenario. Either the description of the issues or the links to the scenario may be weak. There may be occasional errors in spelling, grammar and punctuation. Technical terms will be mainly correct.</p> <p>Low Level Response (1–2 marks)</p> <p>Candidate outlines some obvious legal issues vaguely relevant to a school context. Information will be poorly expressed and there will be a limited, if any, use of technical terms. Errors of grammar, punctuation and spelling may be intrusive.</p> <p>Response not worthy of credit (0 marks)</p> <p>?</p> <p>Examiner's Comments</p> <p>??</p> <p>was the more difficult of the two quality of written communication questions. It was intended to be open ended allowing candidates to take different approaches to demonstrate their understanding by applying their knowledge on two separate parts of the specification and demonstrate their understanding by connecting them to each other and to a given</p>
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						<p>context. As expected the most able candidates did this well and were able to score in the high level band. Most other candidates focused either on legal issues or on different ways of acquiring software without making strong links between the two.</p>
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QUESTION 5

Apu has a handheld e-book reader that allows him to store and read electronic books. The manufacturer of the e-book reader provides proprietary software, which Apu can use to transfer the e-book from the CD-ROM to the e-book reader. Describe what is meant by proprietary software.

5	i	<ul style="list-style-type: none">• Source code not made available/ Only compiled code is published• Licence restricts the copying / modifying / distribution of the software	2	<p>The mention of a licence is not sufficient. Candidate should state that the licence restricts copying / modifying / distributing.</p> <p>"closed source" is not enough because it just gives an alternative term for "proprietary" without a description of what we mean by "closed"</p> <p><u>Examiner's reports</u></p> <p>This part was intended as a more difficult question to differentiate the top candidates, was generally poorly answered. It had been expected that more candidates would be able to provide a definition of proprietary software for part (i) but many candidates appeared unfamiliar with the term in the context in which it is used in the specification. For those who were aware of the term, several common misconceptions were repeated such as the idea that proprietary software is always sold at a cost.</p>	
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Explain **one** advantage to the manufacturer of providing proprietary software instead of open source software.

		ii	<p>eg</p> <ul style="list-style-type: none"> • Stops competing companies copying their software (or hardware / ebooks) • ... and producing similar / better products. • Ensures compatibility (with the e-book reader)... • ... as they can ensure that no modifications have been made <p>(mark points in pairs).</p>	2	<p>The first mark is for identifying a relevant advantage <i>to the manufacturer</i>, and the second for details expanding this point.</p> <p>Accept answers about preventing reverse engineering the company's product or piracy of the company's software or e-books (e.g. DRM) as referring to the first set of answers.</p> <p><u>Examiner's Comments</u></p> <p>This part was intended as a more difficult question to differentiate the top candidates and was generally poorly answered. Because of the general misunderstanding of the concept, and the necessity to apply it in this specific context and give advantages to the manufacture of the e-book reader in (ii), few candidates gained marks here. A common incorrect answer suggested that the manufacturer would benefit from selling the software to e-book users, when it was indicated in the question that the software is provided with the reader. Other incorrect answers appeared to be making points from a previous question about the use of open source software in schools, which did not apply in this context.</p>	
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QUESTION 6

Lauren is a Computing teacher. She is building a website for her Computing class where they can share ideas, send each other programs and discuss computing concepts. The students will have individual accounts that they can log into. Discuss the ethical and legal issues Lauren will have to consider when setting up the website. The quality of your written communication will be assessed in your answer.

6		<p>* Points may include:</p> <p>Legal</p> <ul style="list-style-type: none"> • Data Protection Act • Rules of DPA • Keeping data secure, need for firewall, anti-virus • Methods of restricting access • Intellectual property / copyright / licences <p>Ethical</p> <ul style="list-style-type: none"> • Storing and access to personal information • Rules / terms set up before people can join • Consequences for misconduct e.g. cyberbullying • Plagiarism • Communication of inappropriate materials for students / school / teacher • Backing up to preserve / save data • Gaining parental consent for communication online • E-safety • Acceptable use policy 	6	<p>High Level Response (5–6):</p> <p>A detailed discussion of the ethical and legal issues, with clear explanations that are linked to the scenario.</p> <p>There will be few if any errors in spelling, grammar and punctuation. Technical terms will be used appropriately and correctly.</p> <p>Medium Level Response (3–4):</p> <p>A description of some ethical and / or legal issues with some explanation / justification. Material may not be explicitly linked to the context. There may be occasional errors in spelling, grammar and punctuation. Technical terms will be mainly correct.</p> <p>Low Level Response (1–2):</p> <p>There is an attempt to describe either a legal issue and / or ethical issue. The points are poorly expressed and / or not related to the context. There is limited, if any, use of technical terms. Errors in grammar, punctuation and spelling may be intrusive.</p> <p>Examiner's Comments</p> <p>The majority of candidates wrote a reasonable, structured response to this question. The most common legal issues identified were the Data Protection Act and copyright. Some candidates found the ethical issues more difficult to identify, and confused these with legal issues. The responses given were often well contextualised to the situation.</p>	
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