

Name:

Class Teacher:

Date:



OCR J276

GCSE Computer Science

REVISION BOOKLET – MARK SCHEME

1.6 SYSTEM SECURITY

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 doctor's surgery stores hundreds of patients' details on its computer network. The surgery is concerned about the security of its patients' sensitive medical data. Staff are already required to use strong passwords to protect systems. Explain, with reference to system security, **three** other ways that the surgery could protect the system.

1	a		<ul style="list-style-type: none"> • Firewall (1 - AO2 1a) prevents unauthorised access (1 - AO2 1b) • Anti-malware (1- AO2 1a) removes viruses/spyware from infecting the system (1- AO2 1b) • Encryption (1- AO2 1a) any intercepted data is rendered useless (1- AO2 1b) • User access levels (1- AO2 1a) users have restricted access (1- AO2 1b) • Network policies (1- AO2 1a) rules that define acceptable use (1- AO2 1b) 	6	<p>1 mark to be awarded for each correct type to a maximum of 3 marks. (AO2 1a)</p> <p>1 mark to be awarded for each correct explanation to a maximum of 3 marks. (AO2 1b)</p>
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Identify **three** errors that the surgery's staff could make, that may endanger the security of the network and outline a procedure that could be put in place to prevent each error.

	b		<ul style="list-style-type: none"> • Brings in files via any medium (1- AO2 1a)... • ...not allowing/stopping external devices being used on the network (1-AO2 1b) • Downloading infected files from the internet (1 - AO2 1a)... • ...blocking/restricting access tinsecure websites (1 - AO2 1b) • Allowing physical access to the surgery's network (1 - AO2 1a)... • ...locking of doors/key cards/any physical security procedure (1 - AO2 1b) • Sending/sharing sensitive data with third parties (1- AO2 1a)... • ... blocking/restricting access to USB ports/email/internet/printing (1 - AO2 1b) 	6	<p>1 mark to be awarded for each correct identification to a maximum of 3 marks. (AO2 1b)</p> <p>1 mark to be awarded for each correct outlining of a procedure to a maximum of 3 marks. (AO2 1b)</p> <p>Allow any reasonable combination of error and reasonable procedure to mitigate the risk.</p>
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QUESTION 2

A school has all of its computers in a local area network (LAN). Explain **two** measures which the school will need to take to ensure the security of the network.

2		<p>e.g.</p> <ul style="list-style-type: none">• Passwords protected user accounts• ... to ensure that only authorised people can access the network.• Network policy restrictions e.g. students only allowed to log in during school hours, from certain computers• ... ensures that attempts to enter in the system are likely to be genuine.• Different levels of access / each user can only access the files they need• ... prevents accidental damage to files.• Firewall...• ... to prevent unauthorised access / hacking into the network. <p><i>Marks in pairs. Award one mark for a correctly identified measure and another mark for an appropriate expansion explaining how this measure improves security</i></p>	4	<p>Filtering / censoring is not answering the question (unless candidates explain that web sites known to pose a security threat – e.g. because they are known to distribute viruses – are filtered)</p> <p><u>Examiner's Comments</u></p> <p>The candidates were asked to explain two security measures for a school's network. While most were able to identify two appropriate measures, only the better candidates went on to give a full explanation to gain all the marks. Another common error was to refer to other measures which would normally be taken in a school network without referring to security, for example filtering sites with content that is inappropriate for children.</p>
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QUESTION 3

Security on a computer can be provided directly by the operating system or by using utility programs. Utility programs include antivirus, file transfer, firewall and system clean up. State which **two** of these utilities can be used for security.

3	a	<ul style="list-style-type: none">• antivirus• firewall	2	
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Identify and describe **two** methods by which the operating system can provide additional security directly.

	b	<p>e.g.</p> <ul style="list-style-type: none"> • (User name and) password • Only allows you to use the system if you are authorised • Encryption • Prevents hackers from understanding any data if accessed (e.g. passwords) • Access rights • To prevent files from being modified / deleted • User access control • Prevents users from making changes to the system <p>Marks in pairs</p>	4	<p><i>Accept any security measure that is provided by the operating system itself but not by standard utility programs (even if the utility program is normally bundled with operating systems). The first bullet is for identifying or a brief description of a measure. The second bullet is for a further more detailed description or a description of how the measure ensures security.</i></p> <p>Any reasonable biometrics is acceptable.</p>
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