

Name:

Class Teacher:

Date:



OCR J276

GCSE Computer Science

REVISION BOOKLET – MARK SCHEME

1.4 WIRED AND WIRELESS NETWORKS

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). They want to upgrade their system to utilise cloud storage. Define what is meant by a Wide Area Network.

1	a	<ul style="list-style-type: none"> • The computers are geographically remote/ distanced/ more than a mile apart • Communication medium is not owned by the law firm 	1	<p>1 mark only to be awarded for a correct definition.</p> <p>Accept responses such as the company doesn't own the infrastructure</p> <p>Do not accept 'Network over a wide area' or similar arrangement of wording</p>
---	---	---	---	---

Explain **two** advantages to the law firm of storing their data in the cloud.

	b	<p>Two advantages from:</p> <ul style="list-style-type: none"> • It would offer additional storage (1) so the firm can take on more cases (1) • It is a very efficient method of backing up data (1) and so saves the firm time and money (1) • It would allow their employees to work from anywhere (1) so they can take cases from other countries (1) • It is environmentally friendly (1) • Easy to increase availability of storage (1) • You don't need specialist network skills (1) so the firm don't need to employ more staff (1) • The third party provides security (1) so the firm saves money on staff and software/hardware (1) • The third party provides backup (1) so the firm saves money on staff and software/hardware (1) • Cheaper as don't need own infrastructure (1) <p>Each advantage needs to be contextualised to gain 2 marks.</p>	4	<p>1 mark is to be awarded for each correct advantage, with a mark for a discussion of the advantage related to the law firm. To a maximum of 2 advantages.</p> <p>The total number of marks to be awarded for this task is 4 marks.</p> <p>Responses which are not contextualised will gain a maximum of 1 mark per advantage (to a maximum of 2 advantages)</p>
--	---	---	---	---

Explain **two** disadvantages to the law firm of storing their data in the cloud.

	c	<p>Two disadvantages from:</p> <ul style="list-style-type: none"> • You need a constant internet connection (1) which lawyers who travel a lot may not always have (1) • Reliant on third party to carry out security procedures (1) but the firm are still legally responsible if things go wrong (1) • Reliant on third party for back up connection (1) • Data stored in the cloud will be vulnerable to hacking and other threats (1) which the firm have no control over (1) • Issues regarding data ownership (1) • Implications of Data Protection Act (1) <p>Each disadvantage need to be contextualised to gain 2 marks</p>	4	<p>1 mark is to be awarded for each correct disadvantage with a mark for a discussion of the disadvantage related to the law firm. To a maximum of 2 disadvantages.</p> <p>The total number of marks to be awarded for this task is 4 marks.</p> <p>Responses which are not contextualised will gain a maximum of 1 mark per disadvantage (to a maximum of 2 disadvantages)</p>
--	---	--	---	---

QUESTION 2

A school has all of its computers in a Local Area Network (LAN). State **two** benefits of a LAN.

				<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%; text-align: left;"><u>Examiner's</u></th> <th style="width: 50%; text-align: left;"><u>Comments</u></th> </tr> </thead> <tbody> <tr> <td style="text-align: center; vertical-align: top;">2</td> <td style="vertical-align: top;"> <p>e.g.</p> <ul style="list-style-type: none"> • Can share files / can work collaboratively on same files • Can share hardware resources / suitable example • Can access their files from any computer / classroom • Can work together from different computers using instant messaging • Centralised deployment of software to all computers </td> </tr> </tbody> </table>	<u>Examiner's</u>	<u>Comments</u>	2	<p>e.g.</p> <ul style="list-style-type: none"> • Can share files / can work collaboratively on same files • Can share hardware resources / suitable example • Can access their files from any computer / classroom • Can work together from different computers using instant messaging • Centralised deployment of software to all computers
<u>Examiner's</u>	<u>Comments</u>							
2	<p>e.g.</p> <ul style="list-style-type: none"> • Can share files / can work collaboratively on same files • Can share hardware resources / suitable example • Can access their files from any computer / classroom • Can work together from different computers using instant messaging • Centralised deployment of software to all computers 							
2		<p>e.g.</p> <ul style="list-style-type: none"> • Can share files / can work collaboratively on same files • Can share hardware resources / suitable example • Can access their files from any computer / classroom • Can work together from different computers using instant messaging • Centralised deployment of software to all computers 	2	<p>This question was intended to be fairly straightforward – standard answers for the advantages of having a network in a context in which most of them are familiar. Candidates who did not get full marks here either gave answers that were too vague such as “it allows the computers to communicate with each other” – which is just a definition of what a network does, not an advantage – or they compared a LAN to a WAN. The weakest candidates even tried their luck with very generic answers like “it’s cheaper,” demonstrating little understanding of the actual subject content being tested.</p>				

QUESTION 3

Zoe is organising a LAN-party. Her friends will each bring a computer to the party so that they can play games against each other. Describe what is meant by a Local Area Network (LAN).

3	a	<ul style="list-style-type: none">• Computers are connected to each other• Restricted to a small geographical area / site / other suitable example• Dedicated wired or WiFi connections	2	<p>For the first bullet point candidates should be describing a network – just the idea that computers are connected to “something” is not enough.</p> <p>For the third bullet point, just “connected by cables” is not enough as there is no indication these are dedicated cables for the network.</p> <p><u>Examiner's Comments</u></p> <p>Required candidates to describe what is meant by a Local Area Network, where one mark could be for describing each of the concepts “local area” and “network” in this context. Candidates who did not gain both marks often reused these terms in their answers instead of describing them.</p>
---	---	---	---	--

Zoe plans to use the star topology in the LAN. Describe the star topology. You may use a diagram.

	b	<ul style="list-style-type: none">• One central hub / switch / router / server / connection point• All computers / devices connected to this central point	2	<p>Accept diagram which shows the points in the mark scheme. Note that if the diagram is not annotated or described one mark can still be given for the second bullet point.</p> <p><u>Examiner's Comments</u></p> <p>Did not pose difficulties with most candidates although in some cases, diagrams could have been more clearly labelled.</p>
--	---	---	---	---

QUESTION 4

A bank uses a local area network to connect all the computers in its head office. State **two** ways the local area network can be used to monitor the work of employees.

4	a	<p>e.g.</p> <ul style="list-style-type: none"> record log on / log off times remote access / view users' screens audit printing keylogging monitor internet usage / downloads monitoring emails / files sent / copied inspect files in users' areas 	2	<p><i>Accept answers which show how the LAN is used to monitor the work of employees rather than advantages of using a LAN in general</i></p>
---	---	--	---	---

The bank network uses failover. Describe what is meant by failover and justify the need for failover in the network.

	b	<ul style="list-style-type: none"> Redundant components / hardware / capacity (servers / disks / routers etc) is built into the network If there is a failure, network automatically switches to use the spare capacity Allows the bank to continue to operate / avoids network downtime avoiding loss of income / customer dissatisfaction / loss of records / other example related to the bank 	4	
--	---	---	---	--

QUESTION 5

A company, OCR Supermarkets, has supermarket stores throughout the country. The computers for each store connect to the central office using a Wide Area Network (WAN). Identify **two** differences between a WAN and a LAN (Local Area Network).

5	a	<ul style="list-style-type: none"> WAN is over a large geographical area / needs to transmit over a large distance / a LAN is over a small geographical area. WAN uses external hardware / infrastructure / cables / network / LAN has its own infrastructure / cables / network / hardware due to distance / practicalities 	2	<p>NB Examples of infrastructure / hardware are allowed for WAN e.g. satellite, phone lines, Internet Allow LAN as Ethernet for second bullet</p> <p>NOT wide area for WAN</p> <p>Examiner's Comments</p> <p>Many candidates were able to correctly identify the difference in size between a WAN and a LAN. The better candidates also identified the difference in hardware, or ownership of the hardware used.</p>
---	---	--	---	--

OCR Supermarkets use a client-server network to connect the checkout computers to the store's server. Describe **two** benefits to OCR Supermarkets of using a client-server network instead of a peer-to-peer network.

	b	<p>2 marks per benefit</p> <p>E.g.</p> <ul style="list-style-type: none"> • All files can be stored centrally • ... so workers can access files from any computer • ... all computers can update the central database / file • ... Peer-to-peer files might be stored on their own computers / spread across many computers • Backups are central • ... all data is backed up each time • ... individual computers do not need to backup their own data • ... Peer-to-peer may need to perform their own backups. • Monitor clients • ...to ensure they are working correctly • Upgrade software centrally • ...so you do not have to install on each computer individually • Central security (antivirus / firewall) • ... do not need to install protection on all computers • ...Peer-to-peer individual security may need to be installed on individual computers 	4	<p>Do not allow:</p> <ul style="list-style-type: none"> -easy to share data -"more secure" <p>Examiner's Comments</p> <p>This question was not answered well, with few candidate able to demonstrate an understanding of client-server and peer-to-peer networks. The most common response was the central storage of data, although this was often not expanded to explain why this is a benefit.</p>
--	---	--	---	---