EDEXCEL INTERNATIONAL GCSE (9–1)

eBook included

INFORMATION AND COMMUNICATION TECHNOLOGY

Student Book

Pete Bell

Pearson

TEACHER RESOURCE PACK

International GCSE ICT

Sample examination paper

Paper 1 QP

1. Emma is a teacher in a primary school, teaching children aged 8 to 10. The school has two computer rooms, each room has 20 computers in.

(a)(i) Which **one** type of network connects the computers?

☐ **A** wide area network

☐ **B** local area network

☐ **C** personal area network.

(1)

(ii) Which **one** device stores data that all the computers can access?

☐ **A** modem

☐ **B** server

☐ **C** router

☐ **D** gateway.

(1)

(iii) Identify **three** components not given in **part (a)(ii)** that can be used within the network.

1……

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2……

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3……

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(3)

(b) Students can use the computers to access the Internet.

(i) Which **one** type of software is needed for students to access the Internet?

☐ **A** word processor

☐ **B** spreadsheet

☐ **C** web browser

☐ **D** graphic manipulation software

☐ **E** email software.

(1)

(ii) Each computer has a MAC (media access control) address, and when the computers connect to the network they are given an IP (internet protocol) address. Describe MAC and IP addresses.

MAC

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IP

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(4)

(c) The school has four laptops that connect to the network wirelessly.

(i) State **three** benefits of the laptops connecting using wireless instead of wired communication.

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2……

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(3)

(ii) Explain why the laptops connect using Wi-Fi instead of Bluetooth.

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(4)

(d) The school was worried about allowing the students access to the Internet.

Discuss the factors that the school may have considered before allowing the students access to the Internet.

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Mark Scheme

International GCSE ICT

Paper 1

Question	Answer	Mark
1(a)(i)	B (local area network)	**1**
1(a)(ii)	B (server)	**1**
1(a)(iii)	Any **three** of the following: • network interface card • wireless access point • switch • hub • (copper) cable • fibre-optic cable • booster	**3**
1(b)(i)	C (web browser)	**1**
1(b)(ii)	MAC – any **two** from the following: • unique identifier given to a device that can connect to a network • assigned by the manufacturer • made up of the manufacturer number • followed by the serial number. IP – any **two** from the following: • represents the device's location • allocated by ISP/router • can be dynamic or static • dynamic = the address changes • static = the address stays the same.	**4**
1(c)(i)	Any **three** from: • cables do not need to be purchased • devices can be moved/portable • easier to add new devices • cables do not need to be set up.	**3**
1(c)(ii)	Any **four** from: • Wi-Fi transmits over further distance • the laptops can be further away from the WAP • Wi-Fi has higher bandwidth • data is transferred faster • Wi-Fi transmission is more secure • data can be encrypted • less likely to intercepted and stolen • Wi-Fi can have multiple devices connecting at a time • there are multiple laptops that need to connect at the same time.	**4**
1(d)	Candidates should explain the factors that need to be considered before allowing children to access the Internet. The indicative content is not exhaustive/prescriptive and students should be credited for any relevant content. **Esafety** • access to inappropriate material • access to people they do not know • the students will need additional lessons on how to stay safe. **Collaborative methods**	**8**

	Students can communicate using a range of methods, e.g: • emailing each other and teachers • joining forums to communicate with others internal and external to the school • social networking sites. **Social interaction** • students can communicate with each other e.g. email • students can communicate with other children around the world • access to other cultures and experiences they may not otherwise have • students will have access to social networking (which they are too young to access). **Cyberbullying** • students may receive upsetting or hurtful messages • students may undertake cyberbullying of each other or other people. **Security** • The school will need to set up security measures to protect the data e.g. anti-virus, firewall. • The school will need to restrict the sites students can access.	

Paper 1

Q No	Marks	AO1	AO2	AO3	Spec point
1ai	1		1		2.1.2
1aii	1	1			2.3.2
1aiii	3	2	1		2.3.2
1bi	1		1		2.3.3
1bii	4	4			2.3.1
1ci	3	2	1		2.2.2
1cii	4	1	3		2.1.4
1d	8	1	2	5	3.2
1e	4	4			3.6.1
1f	4	2	2		3.8.6
2ai	4	2	1	1	3.1.1
2aii	3	2	1		3.1.2
2aiii	4	2	2		3.1.2
2b	2	1	1		3.1.3
2c	4	1	2	1	3.2, 3.3, 3.4, 3.5
2d	3	1	2		3.8.1
3ai	3	3			3.6.1
3aii	4	2	2		3.6.1, 3.2
3b	2	1	1		3.7.3
3c	8	1	2	5	3.8
4a	1	1			1.1.1
4bi	1	1			1.1.2
4bii	1	1			1.1.7
4ci	2	2			1.2.1
4cii	6			6	1.2.2
4di	1	1			1.3.2
4dii	4			4	1.3.7
5ai	2	2			1.6.2
5aii	2	2			1.6.3
5bi	2		2		1.7.2
5bii	2		2		1.5, 1.6
5ci	2			2	4.3.1
5cii	4			4	4.3.1
Actual	100	43	29	28	
Target	100	40-43	28-32	26-28	

100 marks	
AO1	Demonstrate knowledge and understanding of Information and Communication Technology (ICT)
AO2	Apply knowledge, understanding and skills to produce ICT based solutions
AO3	Analyse, evaluate, make reasoned judgements and present conclusions

Describe - keyword

- State the points
- Give the characteristics
- Give the main features

Question 1b(ii)

Each computer has a MAC (media access control) address, and when the computers connect to the network they are given an IP (internet protocol) address.

Describe MAC and IP addresses. (4)

What does the question want?

4 marks total = 2 marks each. This means 2 points for MAC and 2 points for IP.

Describe = characteristics/features i.e. what do they look like, how are they given, etc.

This is given in the question – no point in repeating it.

Saying it's a number is not enough, this needs to say what is special about it, i.e. it is unique.

MAC stands for Media Access Control, it's a number that's given to computers so they can connect to a network.

This is given in the question – no point in repeating it.

IP stands for Internet Protocol. It's a number that lets computers go on the Internet.

This is given in the question – no point in repeating it.

An IP doesn't only let you go on the Internet, so this is not fully accurate.

0 marks

This is a clear characteristic of a MAC address. (1)

A MAC is a unique number that is given to computers and their NICs so they can connect to networks. They are built into the computer by the manufacturer and can't be changed.

Identifies how a device gets a MAC. (1)

An IP is a unique number for a computer that is given by the Internet Service Provider. The IP can change (dynamic) so you get a new one each time you go online, or can stay the same (static) so it always stays the same.

Clearly states how an IP address is given to a computer. (1)

Identifies that it can be static or dynamic and what these mean. (1)

4 marks

Question 1f

The schools must ensure students follow health and safety rules when using the computers.

Describe **two** health and safety risks associated with using computers. (4)

What does the question want?

4 marks total = 2 marks each. Identify a risk and then describe it.

Describe = characteristics/features, i.e. what are the risks? How do the risks come about?

Risk identified, but the name could be clearer, e.g. eye strain. (1)

You don't get eye strain because you don't go to the opticians.

1. You can get problems with your eyes if you don't get them checked at the opticians enough.
2. Cables are a risk because they can be put on the floor and you can trip over them and hurt yourself.

Trailing cables identified as a risk. (1)

The problem with the trailing cables described. (1)

3 marks

Risk identified, the abbreviation is ok. (1)

Good description of how you can get RSI. (1)

1. RSI. When you are using a keyboard and mouse without proper posture then you get problems in your wrists.
2. When the light is poor in the room, either too bright or too dark, then you can get eye strain from looking at computer screens.

Eye strain identified. (1)

The method of getting eye strain is given before the name but still suitable. (1)

4 marks

Lesson Plan 4: Digital communication

Specification links: 2.1.1–2.1.4

Alignment with Student Book: pages 65–78

Resources:

- Student Book
- Worksheet 4: Digital communication
- key cards (e.g. 10 cm x 5 cm blank card with methods of communication on one side, blank on the back, or structured for lower ability)
- A4 or A3 paper for the mind map.

Learning objectives:

- understand why devices communicate
- understand the purpose of a range of network types
- understand the need for both wired and wireless connections
- recognise a range of wireless connections
- understand the benefits and drawbacks of using Wi-Fi and Bluetooth.

Success criteria:

Students should be able to:

- describe the differences between different types of network
- identify different methods of wireless communications
- describe the benefits and drawbacks of using Wi-Fi and Bluetooth
- recommend and justify the use of a communication method for a scenario.

Possible misconceptions and barriers:

Some students may assume all wireless communication is Wi-Fi.

Students may be challenged by unfamiliar terms (e.g. 3G, Bluetooth, GPS, NFC) and the similarities between some methods of communication (e.g. Bluetooth vs wireless, 3G vs 4G).

Starter

Ask students to list all the devices they use or encounter each day. Ask them to group the devices into those that ‘stand alone’ (are not connected to any other device), and those that are networked (are connected to or can connect to another device).

Review starter

Ask students for their answers to the starter activity and list the devices to produce a

comprehensive list of devices that students encounter. Add any additional devices that may be required for later activities, e.g. RFID tags.

Group these into networked and stand-alone devices (it is expected that most devices should go into the networked category).

Discuss the purpose of networks and how communication between devices is important.

Activity 1 – research into networks

Split the class into small groups (could be working in pairs), arrange groups to allow for a mix of ability. Give each group a topic from LAN, WAN, PAN and tethering.

Each group must find out:

1. what the abbreviations stand for
2. one characteristic of the network
3. one example of applications for the network
4. one advantage of the type of network
5. one disadvantage of the type of network.

Discussion – networks

Each group must present their findings, collect their answers on the board to produce a comprehensive list of characteristics, examples, advantages and disadvantages. Challenge higher ability students to explain or justify their answers, e.g. Why is that an advantage?

Produce the findings as a document for each student.

Activity 2 – wired vs wireless

Give students the titles ‘wired’ and ‘wireless’. Ask students to put the devices they identified in the starter into groups wired and wireless (some may appear in both).

Discussion – wireless communication

Focus on wireless communication and the devices the students identified as communicating wirelessly. Describe each type of wireless communication one by one.

- Wi-Fi
- Bluetooth
- GPS

- 3G
- 4G
- infrared (IR)
- near-field communication (NFC).

After each method, students have to identify the devices from the list that they think will use it. This could be done using voting, e.g. read through each device one by one and students vote by raising a hand or standing up if they think the device will use that method of communication.

Challenge some students, especially those of higher ability, to ask why that device might use it.

Activity 3 – key cards with communication

Give students key cards with the different types of communication written on one side and a blank space on the back. Candidates have to write a description of each method and list the devices that use it on the space on the back

NB: This could be done during the discussion exercise.

Discussion – Bluetooth vs Wi-Fi

Ask how many candidates have used Wi-Fi, and how many have used Bluetooth. Ask students what they have used them for, any problems they found, etc. – e.g. Bluetooth has a limited range.

Challenge students through questioning to identify the key features of Wi-Fi and Bluetooth and list the advantages and disadvantages. Ask students to add these advantages and disadvantages to their key cards.

Worksheet

Ask students to complete Worksheet 4.

Plenary

Ask students to create a mind map with types of digital communications. They need to fit in the key information about types of network and methods of wireless communication. Encourage students to use abbreviations, key points, etc. instead of writing full sentences.

Differentiation

Lower ability students:

Provide structured worksheets or resources for students to research the information from. For example, give students a template to help them complete the points for the research into networks activity or provide students with websites or textbook pages next to each task to signpost where they can get help from. Pair students with more able students.

Higher ability students:

Encourage explanations and justifications of any points made, e.g. advantages. Encourage justification related to any scenarios used, e.g. why is wireless communication more appropriate in a given situation?

Homework

Ask students to create a guide to different types of network, this could be linked with another unit, e.g. presentation software, by asking students to create an interactive presentation about types of network.

Worksheet 4

Digital communication

1. Complete the sentences by filling in the missing words. Use the words from the box below.

A _____ is a collection of devices connected over a _____ geographical area, e.g. under a mile. The hardware is owned and maintained by the company.

A _____ is a collection of devices connected over a _____ geographical area, it might be several local area networks. The devices are connected using general infrastructure such as _____.

A _____ is a small network between two devices, for example between a _____ and a _____.

large	LAN	mobile phone	PAN	WAN	small	smart watch	telephone lines

2. Write a list of all the Personal Area Networks (PANs) that you have used or seen being used. (Talk to your friends and use their list to increase your range of examples.)

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3. Write the names of **four** devices that connect to a network in the first column. For each device, describe what they use the network for (for example, what do they access, what data do they send?) In the final column, write the most appropriate method of communication for the network use.

Device	**Network use**	**Communication method**

Extension: Justify the communication method(s) you chose.

4. The differences between Wi-Fi and Bluetooth. Fill in the table, describing Wi-Fi and Bluetooth for each row.

	Bluetooth	**Wi-Fi**
Distance it can transmit		
Line of sight needed?		
Transfer rate		
Number of devices it can connect		
Level of security		
Power required		