Ethical, cultural, environmental and privacy issues

Computer systems (Paper 1) · revision notes

The impact of digital technology on wider society: ethical issues (what is right and fair), cultural issues (how the way people live changes), environmental issues (energy, resources and e-waste) and privacy issues (how personal data is collected and used). This topic is often assessed with an 8-mark 'Discuss' question based on a scenario, marked in levels.

Key facts

- Ethical = right, wrong and fair (jobs, bias, monitoring, digital divide)
- Environmental = e-waste, energy use, raw materials (and benefits such as less travel)
- Digital divide = gap between people with and without access to technology
- Cultural = changes to how people live, work and communicate
- Privacy = how personal data is collected, used, shared and protected
- Stakeholders = everyone affected: users, staff, owners, society

Notes

Ethical and cultural issues

- **Ethical** issues are about what is right, wrong or fair. Examples: **automation** replacing jobs, decisions made by AI that may be biased, the monitoring of employees, and the **digital divide**.
- The **digital divide** is the gap between people who have access to digital technology and the Internet and those who do not, because of cost, location (e.g. poor rural broadband), age, skills or disability.
- **Cultural** issues are about how technology changes the way people live, work and communicate: social media, online shopping, streaming, working from home, and trends spreading around the world.
- Cultural changes can be positive (keeping in touch, new careers, online communities) or negative (less face-to-face contact, cyberbullying, pressure to present a perfect image).

Environmental issues

- **E-waste**: discarded devices contain toxic materials (e.g. lead and mercury) that can pollute soil and water; much of it goes to landfill or is shipped to other countries.
- **Energy**: devices and data centres use large amounts of electricity, much of it generated from fossil fuels.
- **Raw materials**: making devices needs metals that must be mined, which damages habitats and uses up non-renewable resources.
- Positive impacts: video calls reduce travel, digital documents reduce paper use, and smart systems can cut energy use. Repairing and recycling devices reduces waste.

Privacy issues

- Organisations collect large amounts of **personal data**: location from phones, browsing habits, purchases, and images from CCTV and facial recognition.
- The data may be shared or sold for targeted advertising, used to build a profile of a person, or exposed in a **data breach**.
- People must balance **convenience and safety** against their right to privacy.

How to answer each type of question

Explain the digital divide 2 to 3 marks **Grade 4**

1. Define it: the gap between those with and without access to technology.
2. Give a cause and, if asked, an effect on the people affected.

Example. Explain what is meant by the digital divide and give **one** cause of it. [2]

Model answer. The gap between people who have access to digital technology and the Internet and those who do not (1). Cause: some people cannot afford devices or broadband / some rural areas have poor broadband coverage (1).

Explain one type of issue 2 to 4 marks **Grade 5**

1. Name the issue, e.g. e-waste.
2. Explain its effect, e.g. toxic chemicals pollute soil and water.
3. For 'two' issues, give two different issues, each with its own explanation.

Example. Explain **two** environmental impacts of the large data centres that store cloud data. [4]

Model answer. Data centres use large amounts of electricity to run and cool their servers (1); if this is generated from fossil fuels, it releases carbon dioxide, which contributes to climate change (1). Servers are replaced every few years (1), creating e-waste that contains toxic materials, which can pollute soil and water if it is not recycled (1).

8-mark: discuss the issues in a scenario 8 marks (marked in levels) **Grade 8**

1. Plan: jot down points under each heading the question names (ethical, cultural, environmental, privacy, legal).
2. For each point, apply it to the people in the scenario and explain its effect.
3. Give positive and negative impacts.
4. Finish with a conclusion that weighs up the issues.

Example. A town council plans to replace its library's printed books with e-books and online services that residents use through an app. Discuss the ethical, cultural, environmental and privacy issues of this plan. [8]

Model answer.

Ethical: residents without a smartphone, computer or Internet access at home, often older or poorer people, could lose access to books, which widens the digital divide. However, e-books can be enlarged or read aloud, which helps people with poor eyesight.
Cultural: people could borrow books at any time from anywhere, but the library may stop being a place where people meet, so some residents may feel more isolated.
Environmental: fewer printed books means less paper and transport. However, residents need devices, which use energy and raw materials and eventually become e-waste, and the servers running the service use electricity.
Privacy: the app could record exactly what each resident reads and when, which could reveal personal information about their health or beliefs, so this data must be kept secure and not shared.
Conclusion: the plan is convenient, but the council should keep some printed books and public computers so that no resident is left out.
Top band (6–8 marks): covers all four types of issue, applies each to the library's residents, gives both sides and reaches a supported conclusion.

Don’t lose marks

- Writing a list of one-line points with no explanation. Top-band answers develop and apply each point.
- Only giving negative impacts. Discuss both sides.
- Mixing up ethical and legal: something can be legal but still unethical.
- Ignoring the scenario and writing a general essay about technology.

More tips

Memory tricks

- Plan 8-markers with 'ECEP': Ethical, Cultural, Environmental, Privacy (add L for Legal if the question asks).
- For each point ask 'Who is affected, and how?' Naming the stakeholder makes the point applied.
- Environmental impacts run from cradle to grave: mining → manufacturing → using (energy) → throwing away (e-waste).

Exam technique

- In 8-mark 'Discuss' questions, cover every type of issue named in the question; leaving one out limits your mark band.
- Use linking phrases: 'however', 'on the other hand', 'this means that'.
- End with a short conclusion that follows from your points.
- Depth beats length: four or five well-explained, applied points are better than ten one-line points.

What each grade needs

What you need to be able to do, from the first marks up to the top grade.

Grade 3

Give examples of each type of issue

E.g. job losses (ethical), social media (cultural), e-waste (environmental), location tracking (privacy).

Grade 4

Define the digital divide and its causes

The gap between people with and without access to technology, caused by cost, location, age, skills or disability.

Grade 5

Describe environmental impacts of technology

E-waste, energy used by devices and data centres, and mining for raw materials, plus benefits such as less travel.

Grade 5

Explain privacy issues of data collection

Location tracking, data sold to advertisers and data breaches can expose personal information.

Grade 6

Consider the views of different stakeholders

E.g. how one change affects customers, staff, the company and society in different ways.

Grade 8

Write a balanced 8-mark discussion

Cover each type of issue asked for, apply it to the scenario, give both sides and reach a conclusion.

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