Grade 12 Computing

Unit 8 · Technology, Policy and You

ANSWER KEY · FOR TEACHERS

Full marks 31

Give the marks for the points in the marking scheme; an answer in other words that says the same is right.

1 Key words

1. moral agent
2. moral patient
3. functionalism
4. Moravec's paradox
5. narrow AI
6. impact assessment
7. public register
8. whistleblower

K · 4

Each carries 0.5 mark.

2 Which principle?

1. A wallpaper app copies every contact in the phone, though it needs none of them. → **c.** 1.6 Respect privacy
2. A company says its health chatbot is "never wrong". → **a.** 1.3 Be honest and trustworthy
3. A web developer agrees to write a hospital's medicine dose calculator, a field she has never studied. → **f.** 2.6 Work only in areas of competence
4. A loan model refuses most applicants from one district, and nobody has checked why. → **b.** 1.4 Be fair and don't discriminate

A · 2

Each carries 0.5 mark.

3 True or false

i. ✗ **False:** Trained on human writing, it talks about feelings whether or not it has any: its words alone don't settle it.
ii. ✓ **True**
iii. ✗ **False:** A code is not a law: breaking it can cost membership of the association, or in some professions a license.
iv. ✓ **True**

U · 4

Each carries 1 mark.

4 Multiple choice

i. **b.** A program beats every human at chess, but a robot still struggles to fold laundry. U · 1

The paradox is that what is hard for people (chess) can be easy for machines, while what is easy for people (seeing, moving, handling soft things) is hard for machines. The other three are true, but they are different points.

ii. **c.** questions a body must answer before using a system, whose answers set the safeguards it needs K · 1

An impact assessment comes before a system is used: it finds out how much harm a mistake could do, and the answer decides how many safeguards are needed. A ban is the heaviest tool, a grant one of the lightest, and a label is disclosure.

iii. **b.** explaining why any brain process is felt, why it is like something to see red K · 1

Science can explain more and more of what a brain does. The hard problem, as Chalmers named it in 1995, is why any of it is experienced at all.

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iv. **b.** She was the one punished, though others had more control over how the system was designed and tested. U · 1

The term, Madeleine Clare Elish's, describes how blame falls on the human nearest to an automated system's failure, protecting the system and its makers. Others answer that watching the road was exactly her job; both points belong in a fair debate.

v. **c.** 1.2, avoid harm: report signs of risk, and blow the whistle if leaders won't act A · 1

Principle 1.2 asks professionals to report signs of risk that might cause harm, and says it may be necessary to blow the whistle if leaders don't act. Confidentiality (1.7) doesn't cover hiding a danger to the public.

5 What does it print?

MARKING SCHEME A · 3

- ✓ `0 2 4`: an exact half is rounded to the even choice.
- ✓ `7.2 2.67`: 7.25 is stored exactly, so it goes to the even 7.2; 2.675 is stored a hair below 2.675, so it goes down.
- ✓ `4`: `int` accepts any Unicode decimal digit, so the Devanagari ३ is 3.

6 Short answer

MARKING SCHEME U · 3

- ✓ a. Intelligence: what it can do, settled by testing it on tasks (here only on exam questions).
- ✓ b. Consciousness: whether it feels anything; no agreed test, and a yelp built in by its makers proves nothing.
- ✓ c. Responsibility: decided by people, in law, ethics and the hospital's rules.

7 Long answer

a. ANSWER U · 4

Many people made choices that led to the crash: the engineers whose software kept misclassifying the pedestrian; the managers who left emergency braking to a single safety driver watching for hours, with the car's own safety systems switched off; the state that allowed tests with weak oversight; and the safety driver, who was looking at her phone. Only the driver was prosecuted, and pleaded guilty to endangerment; prosecutors found no basis for criminal charges against Uber.

By **control**, the company had most power over the design: it decided how the system worked and how it was tested, and the NTSB named its inadequate safety culture as a contributing cause. By **knowledge**, a company running such tests should know that people watching an automated system for hours lose attention (the NTSB found it had no real way to deal with this); the driver knew she should watch the road. So a fair answer holds both responsible, the company for the system and the driver for her task, and asks why the person with least control carried the punishment (the **moral crumple zone**).

MARKING SCHEME

- ✓ Several people's choices led to it: the engineers whose software misclassified her, the managers who left braking to one safety driver with the car's own safety systems off, the state's weak oversight, and the driver, who was looking at her phone.
- ✓ Control: the company had most power over how the system was designed and tested (the NTSB named its safety culture).
- ✓ Knowledge: the company should have known that people watching an automated system for hours lose attention; the driver knew she should watch the road.
- ✓ A fair answer holds both responsible, and notes that the person with least control was the one punished: the moral crumple zone.

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b. ANSWER A · 4

Criticism. The problem is real (copying, wrong answers, privacy), but a ban is the heaviest tool, used here for every use, including good ones: a teacher making practice questions, a blind student using voice tools, a class learning how AI works, as the National AI Policy itself plans. It is not proportionate; it is hard to enforce, since most students have phones; and it isn't clear what counts as "AI" (a spell-checker? a translation app?).
A better proposal. Each school writes a policy on AI for schoolwork (as in Grade 9's project): students may use AI where the teacher allows it for a task, and must say how they used it; exams and graded work done in class stay without AI; teachers are trained to design tasks that need students' own thinking; no student's personal data is entered into AI tools; the policy is reviewed each year with what teachers and students report.

MARKING SCHEME

- ✓ The problem is real (copying, wrong answers, privacy), but a ban is the heaviest tool, used for every use, good ones too (a teacher making practice questions, a blind student's voice tools, learning how AI works).
- ✓ It is not proportionate, hard to enforce when most students have phones, and unclear about what counts as AI.
- ✓ A better proposal uses lighter tools where they fit: each school's own policy, AI allowed where the teacher says and its use declared, exams without AI.
- ✓ With safeguards and review: no personal data in AI tools, teachers trained, the policy reviewed each year.

8 Think

ANSWER HA · 2

No. Legal is not the same as right. The contacts never agreed to anything: their numbers are taken and they may be called and shamed over someone else's loan, so it harms people who are not even the app's users (1.2, avoid harm), and it collects far more data than a loan needs (1.6, collect only what you need, for a clear purpose). A borrower who needs money can hardly refuse the permission, so the consent is weak. I would say so to the manager in these words, offer another way (a guarantor the borrower names, who agrees to be named), and if the company still went ahead, take it higher.

MARKING SCHEME

- ✓ Not right though legal: the contacts never agreed and can be harmed; far more data than the purpose needs (1.2 and 1.6); a borrower's consent under need is weak.
- ✓ What to say: name the principles, offer a way that needs less data (a guarantor who agrees), and take it higher if the company won't change.

9 Activity: Who gains, who loses?

(not marked)

WHAT STUDENTS SHOULD FIND

For example: patients get urgent medicines, blood and test results in an hour instead of a day, but may come to rely on a service that stops in bad weather or when the funding ends (keep the old route ready, and plan who pays after the first years). Staff save trips but must learn to receive and send drones (training, and a simple landing site). Porters lose paid work (give them the ground jobs: loading, landing sites, deliveries the drones can't carry). People under the flight path worry about noise, privacy and a drone falling (fixed routes away from houses, no cameras pointed down, parachutes). Groups often add the district health office, the airspace regulator or the company that runs the drones. Good groups notice that the people who lose (porters) are not the ones who gain, and that the test is small: one health post for one season, measuring delivery times and how often weather stopped the drones.

Marks by level	Knowledge	Understanding	Application	Higher ability	Total
Marks	6	13	10	2	31

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