

THEME A: CONCEPTS · A4.4

Ethical considerations

Original practice questions · 33 marks · about 50 minutes · covers A4.4.1–A4.4.2

Instructions. Answer all questions. The maximum mark for this paper is [33 marks]. The marks available are shown in brackets. Parts badged **HL** assess higher level only content; standard level students may leave these out.

1**Total: 6 marks**

A large company uses a machine learning model to shortlist job applicants. The model was trained on the company's own hiring decisions from the past ten years. Over that period the company hired very few women into technical roles.

- (a)** Explain how bias in this training data could affect who the model shortlists. **[3]**

- (b)** Outline **one** way the company could reduce this bias. **[2]**

- (c)** State what is meant by algorithmic fairness. **[1]**

2

Total: 6 marks

An applicant is rejected by the model without any human reviewing the decision.

- (a) Explain why applicants should be told that a machine learning system was used to assess them. [3]

- (b) **Discuss** who should be held accountable when the model rejects a well-qualified applicant. [3]

3

Total: 5 marks

A fitness app records users' heart rate, sleep and location. The company that makes it agrees to share this data with a health insurer, which uses it to set premiums.

- (a) Outline what would be required for a user's consent to this arrangement to be informed. [2]

- (b) Explain **one** risk to users of the data being shared in this way. [3]

4

Total: 6 marks

Training very large machine learning models consumes a great deal of electricity, and such models are increasingly used to automate work.

- (a) Outline the environmental impact of training a very large model. [2]

- (b) **Discuss** the societal impact of automating a job that is currently done by many people. [4]

5

Total: 5 marks

A social media platform uses a machine learning model to decide which posts each user is shown. The model is trained to maximise the time users spend on the platform.

- (a) Explain how a system trained in this way can end up spreading misinformation. [3]

- (b) Outline **one** measure the platform could take to reduce this effect. [2]

A manufacturer releases augmented reality glasses that continuously record everything the wearer sees and identify the people who appear in view.

[5]

END OF QUESTIONS