Teacher Answer Key

Case Study

1. Maya was most likely affected by historical bias — the algorithm was trained on past hiring data that reflected patterns of who got hired previously, which often excluded people with non-traditional or interrupted work histories. The AI learned to replicate those patterns without any human explicitly programming it to discriminate.

2. The statement means that deciding what counts as a "fair" AI system requires value judgments, not just code fixes. In Maya's case, engineers could adjust the algorithm, but they would first need to agree on what fairness means — equal treatment regardless of work history, equal outcomes across groups, or something else — and those are ethical and political choices, not purely technical ones.

Multiple Choice

1. C

2. D

3. A

Matching

1-C, 2-A, 3-B, 4-E, 5-D

Fill-in-the-Blank

1) systematic, 2) proxy, 3) Shades

Short Answer (Sample Responses)

Q1: While computers do use mathematical operations, the rules they learn are derived from human-created data, which reflects human history and human biases. The math itself may be neutral, but the patterns the AI extracts from biased training data are not — so the output can be systematically unfair even without any explicit discrimination in the code.

Q2: Representation bias occurs when certain groups are underrepresented or absent from training data, causing an AI to perform poorly for those groups. The reading uses facial recognition systems trained mostly on light-skinned individuals as an example — those systems became significantly less accurate when encountering darker-skinned faces because they had fewer examples of those faces to learn from.

Q3: Two approaches mentioned are diverse training data and independent bias audits. The limitation of diverse data is that it does not address all forms of bias, particularly historical or measurement bias. Bias audits are useful but not standardized, and the reading notes that fundamental questions about what fairness means remain unresolved, so no single technical solution eliminates the problem.