1. Short Answer Questions

Q1: Define algorithmic bias and provide two examples of how it manifests in AI systems.

Answer:
 Algorithmic bias occurs when an AI system produces unfair or prejudiced outcomes due to biased data, flawed design, or unequal representation during model training.

Examples:

1. **Facial recognition systems** misidentifying darker-skinned individuals more often than lighter-skinned people because the training data lacked diversity.

2. **Hiring algorithms** favoring male applicants over female ones if the model was trained on historical data from a male-dominated workforce.

Q2: Explain the difference between transparency and explainability in AI. Why are both important?

Answer:

- **Transparency** means clearly disclosing how an AI system works — including data sources, model design, and decision processes.

- **Explainability** refers to making AI decisions understandable to humans (why and how a result was produced).

Importance:
 Both are essential for **trust** and **accountability**. Transparency allows users and regulators to inspect systems, while explainability helps users understand and challenge AI decisions when needed.

Q3: How does GDPR (General Data Protection Regulation) impact AI development in the EU?

Answer:
 GDPR affects AI development by enforcing:

- **Data protection and privacy rights** — AI systems must collect and process personal data lawfully and with user consent.

- **Right to explanation** — individuals can ask for clarification about automated decisions that affect them.

- **Data minimization** — only relevant data should be used to train AI models.

These rules push developers to design **ethical, transparent, and privacy-friendly AI systems**.

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2. Ethical Principles Matching

Principle	Definition
A) Justice	Fair distribution of AI benefits and risks.
B) Non-maleficence	Ensuring AI does not harm individuals or society.
C) Autonomy	Respecting users' right to control their data and decisions.
D) Sustainability	Designing AI to be environmentally friendly.