**1. Short Answer Questions**

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

**Algorithmic bias** occurs when an AI system produces unfair or discriminatory outcomes due to flawed assumptions, biased training data, or design choices.

**Examples:**

1. **Hiring algorithms** favoring male candidates because historical hiring data was male-dominated.
2. **Facial recognition systems** performing poorly on darker-skinned individuals due to underrepresentation in training datasets.

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

* **Transparency** refers to openness about how an AI system is developed, including data sources, model architecture, and decision-making processes.
* **Explainability** refers to the ability to clearly interpret and justify an AI system’s decisions in understandable terms.

**Importance:**

* **Transparency** builds trust and accountability.
* **Explainability** helps users, regulators, and developers understand and correct errors or biases.

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

GDPR imposes strict rules on AI development, including:

* **Right to explanation** (users can demand reasoning behind automated decisions).
* **Data minimization** (AI must use only necessary data).
* **Bias mitigation** (ensuring fairness in algorithmic decisions).
* **User consent & control** over personal data used in AI models.

**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. |