AI Testing Concepts

# 1. Bias

## 🔹 Simple Explanation:

Bias means the system is unfair — it favors one type of input over another.

## 🧠 Real-Life Example:

Imagine a school that only gives admission to students from one city, even though students from other cities are equally qualified. That’s unfair — that’s bias.

## 🧪 Real-Time QA Example:

You’re testing a job portal. You notice that resumes with male names are selected more often than female names, even when qualifications are the same.

## ✅ Defect Report:

System favors male candidates — possible gender bias.

# 2. Fairness

## 🔹 Simple Explanation:

Fairness means the system treats everyone equally, no matter their background.

## 🧠 Real-Life Example:

A fair teacher gives marks based on answers, not based on who the student is.

## 🧪 Real-Time QA Example:

You test a loan approval system. You enter the same income and credit score for two users — one from a metro city and one from a rural area. If only the metro user gets approved, that’s unfair.

## ✅ Defect Report:

Loan approval logic may be unfair based on location.

# 3. Explainability

## 🔹 Simple Explanation:

Explainability means the system should tell you why it made a decision.

## 🧠 Real-Life Example:

If your bank rejects your loan, you want to know why — was it your income, credit score, or something else?

## 🧪 Real-Time QA Example:

You test a fraud detection system. It blocks a transaction but doesn’t say why.

## ✅ Defect Report:

System should explain reason for blocking — missing explainability.

# 4. Overfitting

## 🔹 Simple Explanation:

Overfitting means the system is too smart for its training data but fails in real life.

## 🧠 Real-Life Example:

A student memorizes answers from one book. In the exam, questions are different — and the student fails.

## 🧪 Real-Time QA Example:

You test a chatbot. It answers perfectly for known questions but gives wrong answers for new ones.

## ✅ Defect Report:

Chatbot performs well on trained data but fails on new inputs — possible overfitting.

# 5. Underfitting

## 🔹 Simple Explanation:

Underfitting means the system didn’t learn enough — it performs badly everywhere.

## 🧠 Real-Life Example:

A student barely studies and fails both practice tests and final exams.

## 🧪 Real-Time QA Example:

You test a recommendation engine. It gives random suggestions — even for known user preferences.

## ✅ Defect Report:

System not learning patterns — possible underfitting.

# 🧠 Memory Tip for Interviews:

You can say:  
  
“I test AI systems like any smart software. I check if they’re fair, if they explain their decisions, and if they behave consistently with both known and new data. I don’t use deep AI terms — I focus on real-world behavior.”