1) What is Flutter?

- Flutter is Google's UI toolkit for building beautiful, natively compiled applications for mobile, web , and desktop for a single codebase.
- Fast development
- Expressive and flexible UI .
- Native performance.
- Open source .

2) How can Flutter build apps for different platform using one codebase?

أنا مكنتش عارفة إجابة منظمة أكتبها كإجابة كافية ف عملت سيرش وده اللى طلع معايا :

Flutter achieves cross-platform development through the following mechanisms:

Single Codebase: Developers write one set of code in Dart, which can be compiled to run on multiple platforms (iOS, Android, Web, Windows, macOS, Linux).

Widgets: Flutter provides a comprehensive set of customizable widgets that render consistently across platforms. These widgets are not platform-specific but are designed to look and feel native on each platform.

Dart Compilation: Flutter apps are compiled into native machine code using Dart's ahead-of-time (AOT) compilation for mobile and desktop, and just-in-time (JIT) compilation for development and web.

Skia Graphics Engine: Flutter uses the Skia engine to render UI components, ensuring high performance and consistency across platforms.

Platform Channels: For platform-specific functionality (e.g., accessing device hardware), Flutter provides platform channels to communicate between Dart code and native code (Java/Kotlin for Android, Swift/Objective-C for iOS).

3) What is meant by: directory, package, library, framework, SDK, IDE?

Directory:

A folder or container in a file system that holds files and other directories.

It helps organize and manage code and resources in a project.

Package:

A collection of Dart code that can be shared and reused. Packages can include libraries, tools, and dependencies.

Library:

A collection of reusable code (functions, classes, variables) that can be imported into a Dart project.

 Libraries help modularize code and avoid repetition.

Framework:

A structured set of tools, libraries, and conventions that provide a foundation for building applications.

 Flutter is a framework that includes widgets, rendering, and other utilities.

SDK (Software Development Kit):

 A collection of tools, libraries, documentation, and samples that developers use to build applications for a specific platform or technology.

 Flutter is an SDK for building cross-platform apps.

IDE (Integrated Development Environment):

A software application that provides comprehensive facilities for coding, debugging, and testing. **Examples** include Android Studio, Visual Studio Code.

4) What is a Widget? Give as many examples as you can.

is a building block for the user interface. Everything in Flutter is a widget, from structural elements (like buttons and text) to layout elements (like rows and columns).

 Widgets are immutable and describe what the UI should look like given their current configuration and state.

A flutter application is just a combination of widgets .

Examples: Text () , container() , Row and column , Button() ,Scaffold() , AppBar() ,center(), etc.

5) What is state? and What is the difference between stateless and stateful widgets?

State refers to the data that can change during the lifetime of a widget.

It determines how a widget behaves and what it displays.

Stateless Widget	Stateful Widget
A widget that does not have mutable state.	A widget that has mutable state.
It is immutable and can't change once built.	It can change dynamically in response to user interactions or other events.
Used for static content or UI that does not depend on dynamic data.	Used for interactive or dynamic content.
Example: A text label or an icon.	**Example**: A counter app or a form.