Android Application Development Assignment

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Q1: Android Development Environment and Key Components

Android Studio: Official IDE for Android development. It provides code editor, UI designer, emulator integration, debugging tools, and built-in Gradle support.

Android SDK (Software Development Kit): A collection of tools, libraries, and APIs required to develop Android applications. It includes platform tools, build tools, and system images.

AVD (Android Virtual Device): An emulator configuration that simulates an Android device for testing apps without a physical device.

Gradle: A build automation system used to compile code, manage dependencies, and package the Android application into an APK or AAB.

Role of Important Project Components

AndroidManifest.xml: Defines essential information about the app such as package name, app components (activities, services), permissions, and minimum SDK version.

Gradle Scripts: Used to configure build settings, SDK versions, dependencies, and plugins for the project and modules.

res Directory: Contains non-code resources like layouts (XML), images, colors, strings, and styles used in the app UI.

java Directory: Contains Java/Kotlin source code including activities, fragments, and other classes that define app logic.

Common Dependency Issues and Solutions

Gradle Sync Failed: Often caused by internet issues or incorrect dependency versions. Solution: Check internet connection, update Gradle, and use correct dependency versions.

SDK Version Mismatch: Occurs when dependencies require a higher SDK. Solution: Update compileSdkVersion and targetSdkVersion in Gradle files.

Missing SDK Tools: Build fails if required SDK components are not installed. Solution: Install missing tools using SDK Manager.

Q2: Installation, Configuration, and HelloWorldApp

Installation and Configuration Guide:
1. Download Android Studio from official website.
2. Install Android Studio and select Standard setup.
3. Install required SDK tools, platform tools, and emulator.
4. Configure SDK Manager and create an AVD.

Create New Project:
Project Name: HelloWorldApp
Template: Empty Activity
Language: Java
Minimum SDK: API 21 or above.

Run the App:
Run the application on Android Emulator or a connected physical device. The app displays "Name, Roll #" on the screen.

Screenshots (To be Attached)

• Screenshot of running app showing Name and Roll Number.
• Screenshot of Android Studio project structure.

Reflection (4–5 Lines)

During Android Studio setup, I faced Gradle sync issues due to slow internet connection. Some SDK components were missing and had to be installed manually from SDK Manager. Initially, the emulator was slow, but performance improved after enabling hardware acceleration. Overall, the setup process helped me understand Android project structure and build system better.