Introduction to Android

Android is the world's most popular mobile platform. It powers hundreds of millions of mobile devices. It is used in more than 190 countries around the world.

Android gives a world-class platform for creating apps and games for Android users.

Android applications have its own reach and thus possess following advantages:

- **High Reach of SDK for all categories of application:**

  Android SDK includes all the features required for the application development including Maps, GPS, Audio, Media, network, Graphics etc.

- **Android being Open Source gives wide range of development:**

  Android application being open source are not bound under any restrictions. Any individual is free to make any type of application using all the resources available. All the resources used by Android Development team are publicly open to use in own applications.

- **Applications are not sandboxed**

  Android applications are not restricted to their own domain. Any application can use or access the resources from other applications. This helps us stop the reinvention of wheel by allowing the use of something that exists already. Some of the examples for this are: Photo application from Android.

- **Application reach to audience is cheap:**

  Android has been successful in delivering smart phones at very cheap rates to the people. The devices using Android are cheap and easily affordable.

➚ **Development Setup is cheap:**

Since Android is open source and is not restricted to any proprietary, its development does not require any purchase of licensed software or any development machines in specific.

➚ **Less Hassles from Publishing Platforms.**

The publishing platform for Android Apps does not have to undergo any approval process. Thus app does not takes time to be available for public use.

➚ **Can Handle Background Processes.**

Android SDK has efficient components that can handle background processes and thus help the application to make full use of it.

Android applications are composed of one or more application components which includes the following:

- Activities
- Services
- Content providers
- Broadcast receivers
- Intents

Each component performs a different role in the overall application behavior, and each one can be activated individually (even by other applications).

The manifest file must declare all components in the application and should also declare all application requirements, such as the minimum version of Android required and any hardware configurations required.

Non-code application resources (images, strings, layout files, etc.) should include alternatives for different device configurations (such as different strings for different languages and different layouts for different screen sizes)

Android Features

1. **Storage**: Uses SQLite, a light weight relational database storage for data storage (really helpful when limited mobile memory storage is to be considered).

2. **Media Support**: Include support for large number of media formats for Images, Audio as well as for Video, like: MPEG-4, MP3, MIDI, WAV, JPEG, PNG, GIF, BMP etc.

3. **Messaging**: Both SMS and MMS are supported.

4. **Web Browser**: Based on Open Source WebKit, now known as Chrome.

5. **Connectivity**: Supports large group of networks like: GSM/EDGE, CDMA, Bluetooth, WiFi, LTE and WiMAX.

6. **Hardware Support**: Accelerometer Sensor, Camera, Digital Compass, Proximity Sensor & GPS and a lot more.

7. **Multi-Touch**: Supports multi-touch screen.

8. **Multi-Task**: Supports application multi-tasking.

9. **Flash Support**: Supports Flash.

10. **Beautiful UI:** Android OS basic screen provides a beautiful and intuitive user interface.

11. **Tethering**: Supports sharing of Internet as wired or wireless hotspots.

Directory structure of Android App:

The Android directory structure is defined and should be followed for all the project development. In Android there are specific folders and specific files as below:

1) Src folder: It contains all the Java files that holds the Business logic of the app. It is possible to create sub folders in the src folder to separate the code as per the need.

2) Gen folder: This contains the automatically generated files in the app. All the resources are managed under this folder.

3) Res folder: This contains a specific subfolders to manage the resources in the app such as images, graphics stored in drawables, media files, layout files, strings file etc.

4) Assets folder: This folder can be used to store all types of media. But only difference between res folder and assets folder is the elements under resource folder are identified uniquely with an integer. The graphics stored inside the res subfolder drawable can be resized compress itself.

5) Android Manifest file: This is the configuration file responsible for managing entire Android application. It contains all the permission and declaration of libraries used in the app.

6) Bin folder: The out put file that runs in emulator is created automatically and gets saved in bin folder.

Expected Question:

1) Write a note on Android for Mobile devices.
2) Justify the statement: “Android apps are not sandboxed.”
3) Explain the directory structure of Android applications.
4) Write the difference between Assets folder and drawable folder.
5) Write the advantages of Android.
6) Explain all the components of Android.
7) Write the fundamentals of Android development.
   (For answer to question 7 refer link given below)
   http://developer.android.com/guide/components/fundamentals.html