MAD VIVA QUESTION BANK

1. **What is android?**

   Android is a mobile operating system based on a modified version of the Linux kernel and other open source software, designed primarily for touchscreen mobile devices such as smartphones and tablets.

2. **Enlist Features of android?**
   - Beautiful UI
   - Connectivity
   - Storage
   - Multi-Touch
   - Multi-Tasking
   - Multi-Language
   - Resizable widgets
   - Messaging
   - Media Support
   - Web Browser

3. **Explain android architecture?**
   - Applications: Applications is the top layer of android architecture. The pre-installed applications like home, contacts, camera, etc and third party applications will be installed on this layer only.
   - Application framework: Application Framework provides several important classes which are used to create an Android application.
   - Application runtime: Android Runtime environment contains components like core libraries and the Dalvik virtual machine(DVM).
   - Platform libraries: The Platform Libraries includes various C/C++ core libraries and Java based libraries such as Media, Graphics, OpenGL etc. to provide a support for android development.
   - Linux Kernel: The linux kernel manages all the available drivers such as display drivers, camera drivers, audio drivers, etc. which are required during the runtime.

4. **Explain android sdk?**
    - The Android SDK is the most important software of android which is installed.
    - The Android SDK provides to test android applications, the API libraries, an emulator, documentation, sample code, developers tools and tutorials which helps in building, testing and debugging apps for Android.
    - Android SDK is made up of two parts:tools and packages.
5. **What is android AVD?**

    An Android Virtual Device (AVD) is a configuration that defines the characteristics of an Android phone, tablet, Wear OS, Android TV, or Automotive OS device that you want to simulate in the Android Emulator.
6. **What is emulator?**

    The Android Emulator simulates Android devices on your computer so that you can test your application on a variety of devices and Android API levels without needing to have each physical device.
7. **What are activities?**
    - Activities dictate the UI and handles the user interaction to the smart phone screen.
    - Activities represent a single screen that user interact.
8. **What are services?**
    - Android service is a component that is used to perform operations on the background such as playing music, handle network transactions, interacting content providers etc.
    - It doesn't has any UI (user interface).
    - The service runs in the background indefinitely even if application is destroyed.
9. **What are intents(Implict and explicit intent)?**
    - Android Intent is the message that is passed between components such as activities, content providers, broadcast receivers, services etc.
    - Implicit Intent: Implicit Intent doesn't specifiy the component. In such case, intent provides information of available components provided by the system that is to be invoked.
    - Explicit Intent: Explicit intent specifies the component. In such case, intent provides the external class to be invoked.

10. Explain main Activity file, manifest and layout file?

- MainActivity: It is the Java file that is automatically kept in this folder by Android studio all the classes will be available here and Android studio will even bundle together the package so that we can work with the file without having to go through all the folders.
- Manifest file: It contains an Android manifest.xml file that is generated by Android studio when we create a project. This file contains the configuration parameters of a project such as Permission services and additional libraries.
- Layout file: Layout specifies the various widgets to be used in the UI and the relationships between such widgets and their containers. Layout files are stored in "res/layout" in the Android application.

11. What are different types of UI compents(Textview, Edit text, button, progress bar)?

- TextView: A TextView displays text to the user and optionally allows them to edit it.
- EditText: A EditText is an overlay over TextView that configures itself to be editable.
- Button: A Button is a Push-button which can be pressed, or clicked, by the user to perform an action.
- ProgressBar: It is used to display the status of work being done like analyzing status of work or downloading a file, etc.

12. What are Layouts (LinearLayout, AbsoluteLayout, TableLayout, FrameLayout, RelativeLayout)?

- A layout defines the structure for a user interface in your app, such as in an activity.
- LinearLayout: LinearLayout is a view group that aligns all children in a single direction, vertically or horizontally.
- AbsoluteLayout: AbsoluteLayout enables you to specify the exact location of its children.
- TableLayout: TableLayout is a view that groups views into rows and columns.
- FrameLayout: The FrameLayout is a placeholder on screen that you can use to display a single view.
- RelativeLayout: RelativeLayout is a view group that displays child views in relative positions.

13. Define: TextView, EditText, Button, ImageButton, CheckBox(attributes and methods)?

- TextView: A TextView displays text to the user and optionally allows them to edit it.
- EditText: A EditText is an overlay over TextView that configures itself to be editable.
- Button: A Button is a Push-button which can be pressed, or clicked, by the user to perform an action.
- ImageButton: This shows a button with an image (instead of text) that can be pressed or clicked by the user.
- CheckBox: A CheckBox is an on/off switch that can be toggled by the user.

14. Explain ListView, GridView, ImageView, ScrollView?

- ListView: List of scrollable items can be displayed in Android using ListView. It helps you to displaying the data in the form of a scrollable list.
- GridView: It is a view group that display items in two dimensional scrolling grid, the grid items are not necessarily predetermined but they are automatically inserted to the layout using a ListAdapter.
- ImageView: It is used to display an image file in application.
- ScrollView: ScrollView is a view group that is used to make vertically scrollable views.

15. What is toast explain with example?

- Toast is used to display information for a period of time.
- It contains a message to be displayed quickly and disappears after specified period of time.
- It does not block the user interaction.
- Example:

```
toast.setGravity(Gravity.TOP | Gravity.LEFT, 0, 0);

toast.setText("Changed Toast Text");

toast.show();
```

16. Explain activity lifecycle?

- onCreate(): This is the first callback and called when the activity is first created.
- onStart(): This callback is called when the activity becomes visible to the user.
- onResume(): This is called when the user starts interacting with the application.
- onPause(): The paused activity does not receive user input and cannot execute any code and called when the current activity is being paused and the previous activity is being resumed.
- onStop(): This callback is called when the activity is no longer visible.
- onDestroy(): This callback is called before the activity is destroyed by the system.
- onRestart(): This callback is called when the activity restarts after stopping it.

17. Adapters In Android

- There are the some commonly used Adapter in Android used to fill the data in the UI components.
  - BaseAdapter – It is parent adapter for all other adapters
  - ArrayAdapter – It is used whenever we have a list of single items which is backed by an array
  - Custom ArrayAdapter – It is used whenever we need to display a custom list
  - SimpleAdapter – It is an easy adapter to map static data to views defined in your XML file

BaseAdapter In Android:

- BaseAdapter is a common base class of a general implementation of an Adapter that can be used in ListView, GridView, Spinner etc.
- Whenever we need a customized list in a ListView or customized grids in a GridView we create our own adapter and extend base adapter in that.
- Base Adapter can be extended to create a custom Adapter for displaying a custom list item.
- ArrayAdapter is also an implementation of BaseAdapter.

ArrayAdapter In Android:

- Whenever we have a list of single items which is backed by an Array, we can use ArrayAdapter. For instance, list of phone contacts, countries or names.
- Here is how android ArrayAdapter looks ::

ArrayAdapter(Context context, int resource, int textViewResourceId, T[] objects)

Custom ArrayAdapter In Android:

- ArrayAdapter is also an implementation of BaseAdapter, so if we want more customization then we can create a custom adapter and extend ArrayAdapter in that.
- Since array adapter is an implementation of BaseAdapter, so we can override all the function's of BaseAdapter in our custom adapter.

SimpleAdapter In Android:

- In Android SimpleAdapter is an easy Adapter to map static data to views defined in an XML file(layout).
- In Android we can specify the data backing to a list as an ArrayList of Maps(i.e. hashmap or other).
- Each entry in a ArrayList is corresponding to one row of a list.
- The Map contains the data for each row.
- Here we also specify an XML file(custom list items file) that defines the views which is used to display the row, and a mapping from keys in the Map to specific views.

18. Creating And Updating Database In Android

- For creating, updating and other operations you need to create a subclass or SQLiteOpenHelper class.
- SQLiteOpenHelper is a helper class to manage database creation and version management.
- It provides two methods onCreate(SQLiteDatabase db), onUpgrade(SQLiteDatabase db, int oldVersion, int newVersion).
- The SQLiteOpenHelper is responsible for opening database if exist, creating database if it does not exists and upgrading if required.
- The SQLiteOpenHelper only require the DATABASE_NAME to create database.
- After extending SQLiteOpenHelper you will need to implement its methods onCreate, onUpgrade and constructor.
- **onCreate(SQLiteDatabase sqLiteDatabase)** method is called only once throughout the application lifecycle. It will be called whenever there is a first call

to getReadableDatabase() or getWritableDatabase() function available in super SQLiteOpenHelper class. So SQLiteOpenHelper class call the onCreate() method after creating database and instantiate SQLiteDatabase object. Database name is passed in constructor call.

- **onUpgrade(SQLiteDatabase db,int oldVersion, int newVersion)** is only called whenever there is a updation in existing version. So to update a version we have to increment the value of version variable passed in the superclass constructor. In onUpgrade method we can write queries to perform whatever action is required. In most example you will see that existing table(s) are being dropped and again onCreate() method is being called to create tables again.

19. Fragments

- In Android, Fragment is a part of an activity which enable more modular activity design.
- It represents a behaviour or a portion of user interface in an Activity.
- We can combine multiple Fragments in Single Activity to build a multi panel UI and reuse a Fragment in multiple Activities.
- We always need to embed Fragment in an activity and the fragment lifecycle is directly affected by the host activity's lifecycle.