

## Raw ubicomp questions 2015

Briefly describe the area of computing known as Ubiquitous Computing. 4 marks

Briefly describe the different wireless networking capabilities available to mobile devices. 4 marks.

List four issues should you bear in mind while developing apps for mobile devices. 4 marks.

Describe the android software stack, in particular mention the content of each layer. 6 marks

Briefly describe the different components of an android application development project. 4 marks

What is an Android Activity. Briefly describe the Activity lifecycle. 5 marks

Write a simple android activity that has a buttonview and a textview and displays the number of times the button was clicked in the textview. 8 marks

Describe 4 layouts used in Android applications. Which is the most versatile, why? 8 marks

What do the properties layout\_height and layout\_width define? What values would you typically use for these properties and what effect do these values have? 5 marks

Describe the weight-box model in the context of UI layouts in Android (5 marks)

Describe the RelativeLayout within Android. In particular discuss the different layout options defined for this type of layout (that is the android:layout\_\*\*\*\*\* attribute). (5 marks)

What is a ListView within the Android UI world? Write an Android application with a ListView of cities. When the user selects one it should display a toast showing them the selected city. (8 marks)

Show using Java code how you would create a custom list view (6 marks)

What are intents within the Android Framework? Distinguish clearly between implicit and explicit intents. 8 marks

Show using java code how you can pass both primitive data and custom objects between activities using intents. 6 marks

Show an example of an implicit and explicit intent using Java code. 4 marks

Why should you not do any potentially lengthy operations on the UI thread? 3 marks

Describe how the AsyncTask is used for doing lengthy operations off the UI thread. Mention doInBackground(), onProgressUpdate(), and onPostExecute() in your answer. 9 marks

What is a Fragment within the Android Framework and why would you use them? 4 marks

Explain how to retrieve Intent data from within a Fragment (4 marks)

Show using Java code how Fragments within the same activity may communicate with each other (4 marks)

Distinguish between a service and an intentservice. Show how each are used. 4 marks

List the main steps involved in writing networked applications in android. 4 marks

Write a method called downloadURL to download the content located at the URL and return it as a String. 6 marks

Write a code segment that will post content across a HttpURLConnection. 5 marks

What options are available when persisting data in Android applications. 4 marks

Show using Java code how SharedPreferences can be used to retrieve values based on keys. 6 marks

Distinguish between saving on internal and external storage in android applications. 4 marks

Distinguish between saving public and private files on external storage in android applications. 4 marks

Write a Java code segment to write a text file to private external storage. Be sure to check if external storage is available. 5 marks

Write a Java code segment to read a list of pictures from public external storage. 5 marks

Show using Java code how you would save an arbitrary file on internal storage. 5 marks

Show the main code statements required to create and, update and query an SQLite database within Android. Mention the cursor object in your answer. 5 marks

Show how you can use the BitmapFactory.Decode.. method to load a smaller version of a Bitmap image into your application. 5 marks

What are the two ways you can make use of the device camera in your Android application? 3 marks

What are the steps involved in capturing pictures and displaying a live video feed from the camera in a custom application. 6 marks

How can you get information on what features the camera supports on an Android device? How can these settings be changed? 4 marks

What are the challenges in determining the user location using mobile devices? 4 marks

What location sources are available to android applications. What are merits of each? 5 marks

Show using Java code how the location manager from the location API can be used to determine the users location. 6 marks

What options are available to test your LBS application using mock locations? 4 marks

What is google play services? What features does it provide? 4 marks

What are the steps involved to get the current location of a device when using google play services API. 5 marks

Write the main code required to take a location (longitude,latitude) and convert it to an address using a geocoder. 4 marks

What is a Geofence in Android, what properties have they got? 4 marks

Sensors Questions

What type of sensors are typically available on android devices? What can these sensors measure? 6 marks

Distinguish between hardware and software based sensors using examples of each. 4 marks

List 4 different types of android sensor. For each type, state what it measures, whether it is hardware or software and what it is used for. 8 marks

What are the main classes and interfaces (4 altogether) that are part of the Sensor framework. State the function of each. 8 marks

What are the 4 main pieces of data that are provided as part of a Sensor event. 4 marks

What is a context in Android Development? 3 marks

Show how you can get a list of every sensor present on a device in Android and how you might check this list for a particular sensor? 4 marks

Explain the significance of the `getMinDelay()` method when using sensors? 3 marks

Show how you can get the resolution, range and power requirements of a Sensor in an android application. You may assume the sensor object exists. 4 marks

Show by implementing the two sensor event handlers how you can retrieve new measurements and detect changes in accuracy. Mention also the sensor delay argument used when registering the listener. 5 marks

How can you restrict a user from seeing your app in Google Play if their device does not support the sensor? 3 marks

Draw a brief sketch of the sensor coordinate system. Show the default orientation for the device in your sketch. 4 marks

Briefly describe 4 best practices for using sensors. 4 marks

List two motion sensors and indicate what they are used for. 4 marks

Implement the `onSensorChanged` event handler for an accelerometer so that it returns the linear acceleration(i.e. removes the gravity component). 6 marks

Write a lux meter application using the light sensor. 10 marks

What is device orientation, and how should you obtain it in an android app. In terms of device orientation, what are roll, pitch and azimuth with respect to the device coordinate system. 5 marks

Write a simple Android SMS messaging app that obtains a phone number and message and sends it using the `SmsManager` API. 8 marks

What is a pending intent in Android? Write a simple app that uses one. 7 marks

Write a simple Notification Activity that uses a pending intent (you may assume the existence of the Activity layouts). 5 marks

Describe in detail the notion of a Broadcast Receiver in the Android Framework. Write a short app that registers for the System phone broadcast and logs a message when it receives one. 10 marks

Briefly describe 4 different types of animation you might use in an android app. 4 marks

Write a method that will crossfade two views in an android user interface. 6 marks

What are the steps involved to use a ViewPager for screen transitions in Android? 5 marks

What are the steps involved in creating Card Flip animations in Android applications? 5 marks

How do you use a layout animation in Android. 4 marks

Describe in detail, 4 best android practices when creating apps for multiple screen sizes and densities. 8 marks

Describe 4 best practices for optimising memory usage in Android applications. 8 marks

Describe 4 best practices for optimising the performance of your android application. 8 marks

Outline the steps involved in using a Threadpool object to send operations to multiple threads. 6 marks

Describe using Java code how you can monitor the charging state and battery level of an Android Device. 5 marks

Describe how the MediaPlayer API is used in Android. In particular discuss the use of the prepareAsync() method, running the media player as a foreground service and using wakelocks. 10 marks.

What step need to be followed before you can use GoogleMaps in your Android application (4 marks)

Describe using Java code the structure of an Activity that will show a Google Map using a MapFragment. In particular discuss the callbacks that are required. (5 marks)

Show using Java code how you would move the camera on a GoogleMap to a new location with a new zoom level and add a Marker at that location. (5 marks)

Show using a suitable example how you can parse a JSONObject withing Android to extract some of the fields. (5 marks)

Briefly discuss the TexttoSpeech API and how it's used in Android applications to achieve basic text to speech functionality (8 marks)