**4. Mini-Test**

1. (Sensor Framework)

A) Write a small code snippet to show how to perform the following tasks:

a) List available sensors on a device

SensorManager **sm**;  
List<Sensor> **sensors**;  
ListView **listview**;

List<String> sensor\_names;

sm = (SensorManager) getSystemService(Context.***SENSOR\_SERVICE***);  
**sensors**=sm.getSensorList(Sensor.***TYPE\_ALL***);  
sensor\_names=**new** ArrayList<String>();  
  
**for** (**int** i=0;i<**sensors**.size();i++){  
 sensor\_names.add(((Sensor)**sensors**.get(i)).getName());  
}  
  
**listview**.setAdapter(**new** ArrayAdapter<String>(**this**, android.R.layout.***simple\_list\_item\_1***, sensor\_names));

b) Retrieve the maximum range of a specific sensor

sensor.getMaximumRange()

c) Register for monitoring accelerometer sensor changes, at the maximum available rate of acquiring data

**sensorManager**.registerListener(**this**, **accelerometerSensor**, SensorManager.SENSOR\_DELAY\_FASTEST);

B) The following code snippet is used to monitor the values of the ACCELEROMETER and PROXIMITY sensors. The values are then passed to the listener activity MyActivity. The code for MyActivity class is omitted for brevity. Lines 19-30 in the onSensorChanged() method contain a mistake. Point out the mistake, and explain how it may cause a problem.

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2. (Activity lifecycle) Describe what happens to an activity, and which methods are called in the following consecutive scenarios:

a) An activity A is in the foreground, then the user starts another activity B.

onPause() is called on A

onStop() is called on A

onCreate() is called on B

onStart() is called on B

onResume() is called on B

b) Activity A is no longer visible.

c) The user navigates back to activity A.

onPause() is called on B

onStop() is called on B

onRestart() is called on A

onStart()is called on A

onResume()is called on A

3. (Resources) How can you make your Android application automatically handle different screen sizes and densities? How can you reference the layout elements defined in an Android XML file in your code?

4. What are Intents? What are they used for? What is the difference between Explicit Intents and Implicit Intents?

5. (Service lifecycle) State whether each of the following sentences is true or false:

a) A servcie started by calling startService() can never be stopped before it finishes its job.

b) Both bound and unbound services can interact with several client processes.

c) A bound service can only be running as long as there is a component bound to it.

d) Services which perform lengthy computations are automatically started in a separate thread from the main thread.

6. (AndroidManifest file) Suppose that you are implementing an Android application that consists of one activity MainActivity and one service LocationService. The service retrieves the user’s current fine-grained location at regular intervals using Android’s Location Services framework. The application sends an sms to a phone number with the current location every hour. Below is the AndroidManifest file for such application. The file is missing three necessary tags for the application to work. List the needed tags.