1. (True/False) Latitude measures degrees east or west of the Prime Meridian.
2. Which is a valid format for Latitude/Longitude measurements?
    a. hours:minutes:seconds
    b. degrees:minutes:seconds
    c. degrees:seconds
    d. degrees:minutes
    e. b and d
3. What is the purpose of a rotation matrix?
4. When will reading the accelerometer on an Android device return 0 m/s^2?
5. How can the Android accelerometer and magnetic field sensors be calibrated?
    a. Letting the device rest on a flat surface for 5 minutes.
    b. Moving the device in a figure-8 pattern.
    c. Standing the device on end with the screen facing north.
    d. Throwing the device to your friend.
6. (True/False) Android networking code should be run in the main activity thread.
7. (True/False) The ultrasonic/sonar sensor on the Vex uses digital I/O.
8. What is the function called that is run when an interrupt is fired?
9. (True/False) A device's MAC address is unique to that device.
10. What is the name of the Android application component that provides the interactive screen?
    a. Widget
    b. Gadget
    c. Screen
    d. Activity
1. What is the name of the filter that implements Differential GPS (DGPS)?
2. There are two types of API calls that can result in an Android device being able to obtain a GPS location, what are they?
3. Why did many teams have issues with the facing direction of their Android devices?
4. What two sensors are needed to calculate the facing direction on Android?
5. What external library did you need to include in your Android application if you wanted to view a Google Map from within your app?
6. What are the three main IDEs in which you can develop android applications?
7. How do you post updates to the Main UI from a seperate Thread?
8. What does a Handler do?
9. What does a Looper do?
10. How would you turn a Thread into a Pipeline thread using handlers and loopers (write Java code)?
1. Which sensors are useful for determining the orientation of the phone? Name two.
2. Why does the magnetometer on the android potentially conflict with the motors on the Vex?
3. What is a means for measuring/determining the speed at which the robot is moving? (Name a sensor and/or technique).
4. What android method part of the SensorListener class is essential to taking action on sensor data changes?
5. What is the name for the debugging tool/technique that stops operation of code at a user specified point and step one at a time over that point or into that point?
6. (True/False) The Android API contains a LocationListener class for programming actions to take on a GPS location change.
7. (True/False) GPS coordinates are always formated in degrees/minutes/seconds under any API or system.
8. (True/False) There is no means to increase the accuracy of GPS.
9. To find the location of a point in n-dimensional space, how many detectors would you need to find the exact location?
10. (True/False) Embedded systems, most of the time, need a external device to program them.1. (True/False) we do not need a sensor to make tilt control work

2. (True/False) Internet connection is needed in order to communicate the vex with the tablet
3. (True/FalsE) Linux was originally developed as a operating system for the alpha instruction set architecture
4. In android development, content providers are able to do what? list at least 3
5. what was the sensor that we found to be uncompatable with the vex controller
6. what is an ad-hoc network?
7. (True/False) TCP was used to set up automatic connection
8. (True/False) Everyone successfully completed the vex robot grand challenge?
9. what is the IEEE standard of operation for ad-hoc network?
   (a):IEEE 802.11
   (b):IEEE 802.10
   (c):IEEE 802.11g
10. (true/False) The tilt control of android utilizes accelerometer to make the vex work 1-what function is called at the begining of an android program?
2-why it is not possible to get the correct orientation in this project?
3-what sensor that determines tilting in the android devices?
4-what was the most difficult task in the third iteration of the project?
5-what is the difference between UDP and TCP in terms of connectivity?
6-What component this semester we were not able to work with?
7-what do longitude and latitude stand in north-south/east-west orientation?
8-what can mac addresses used for?
9-what sensors are used to find the phone/tablet orientation?
10-how to allow an android application to access the GPS service?
1. What service is used to allow map functionality in Android?
2. What is called to modulate the Android display?
   a. Partitioned Display
   b. Split Display
   c. Divided Display
   d. Fragmented Display
3. What is the password to access port 22 on the VEX?
   a. Libqwerk
   b. terk
   c. qwerk
   d. None of the above
4. Which sensors where available to add to the VEX?
   a. Light Sensor
   b. Optical Encoder
   c. Potentiometer
   d. Bump Sensor
   e. Limit Switches
   f. Sonar Sensors
   g. a, b, d, e, and f
   h. All of the above
   i. None of the above
5. True/False Differential GPS is easy to implement in Android?
6. What is Googles latest API update called?
   a. Key Lime Pie (Android 4.4)
   b. Kit Kat (Android 4.4)
   c. Jelly Bean (Android 4.3)
   d. Lemon Cheesecake (Android 5.0)

7. True/False The optical encoder can be used to determine the distance the VEX has traveled.
8. True/False In the Google Maps API there is a built in compass.
9. What is another way to determine the distance the VEX traveled without using the optical encoder?
   a. Two Wire Motors and back-EMF

b. Sonar Sensor
c. Bump Sensor
d. None of the above
e. All of the above

10. True/False Without differential GPS the accuracy of the phone is within 1 meter.

1.) List one household material that blocks magnetic fields?
2.) Is the light sensor a digital or analog device?
3.) Is the bump sensor a digital or analog device?
4.) What filter did we discuss that used a model for evaluating prediction or "believed to be true" estimates?
5.) Name 2 ways to accomplish auto-connect?
6.) What API/services did you need to register Google Maps?
7.) What was the internal component of the optical encoders?
8.) What 2 integral values are necessary in order to navigate to a waypoint?
9.) How many GPS navigation satellites have been launched?
10.) What internal Android sensors allowed for a digital compass?1.What are the three steps of the triple handshake TCP protocol?
2.What three items does the accelerometer provide?
3.In What year was Androic inc. purchased by google? (2005)
4.What does Ubuntu mean?
5.Which sensor inside the android devices is used to determine the tilt control?
6.What was bluetooths original conveived purpose? And what problem did it address?
7.What is the purpose of the kalman filter?
8.What Is the android API used for GPS?
9.Using what API can a map be added for GPS?
10.What is a static IP?
1. What are the three steps of the triple handshake TCP protocol?
2. What is the purpose of rooting a phone or tablet?
3. UDP traffic checks whether or not the client received the packet (T/F)
4. What three items can the accelerometer provide to you?
5. How many GPS satellites are needed for a fix, granted the user is on the ground?
6. What VEX sensor uses the time delay of sound travel to perceive depth?
7. What two bands of frequency are used in the US for 802.11 Wi-Fi?
8. Describe a method or sensor which could be used to measure the speed of the VEX?
9. What is DNS?
10. When receiving GPS coordinates, the values received include the decimal point (T/F)1. What is the course number for Embedded Systems?
2. Where is Dr. Povinelli's office located?
3. What is the name of the standard IDE used to develop for the VEX microcontroller?
4. Name three delicious versions of the Android OS.
5. What is an Android Activity?
6. What is an Android Intent?
7. What are the username and password required to SSH into the VEX?
8. What is one possible solution to prevent the robot's metal from interfering with the phone's facing direction?
9. Suggest a new feature that could be implemented in future Embedded Systems classes.
1. How many GPS satellites are needed for a fix?
2. What function is called at the beginning of the Android application being run?
a. Begin()
b. Start()
c. onStart()
d. onCreate()

e. Create()
3. (T/F) SSH takes place on port 8080
4. What does DNS stand for and where would you be most likely to find it?
5. (T/F) The Kalman Filter was one way to approach GPS naviation that was discussed in class.
6. What is DHCP?
7. (T/F) Static IP's can be set based upon MAC addresses directly within a router.
8. (T/F) A MAC address is comprised of 12 hexidecimal values.
9. (T/F) Differential GPS is less accurate than GPS.
10. What is the most accurate range that DGPS can provide?
a. 15-meters
b. 5-meters
c. 15 feet
d. 1 meter
e. 10 centimeters1. What does the acronym NMEA stand for?
2. (True/False) Electric currents from the Vex induce magnetic fields strong enough to interfere with magnetometer readings.
3. What is a NMEA sentence?
4. (True/False) Using the GPS_PROVIDER location provider requires the permission ACCESS_FINE_LOCATION.
5. (True/False) The GPS location provider returns a location much faster than the Network location provider.
6. (True/False) Differential GPS does not require an internet connection.
7. What is the purpose of the LocationProvider when getting the current GPS location of the Android device?
8. Describe two different methods for getting current the current GPS location of an Android device.
9. (True/False) ACCESS_COARSE_LOCATION permissions provide access to more accurate location providers than ACCESS_FINE_LOCATION permissions.
10. (True/False) The LocationManager.getLastKnownLocation quickly returns the most recent cached location.
1. What type and frequency of wave does the ultrasonic sensor we used in class use to detect obstacles?
2. What does the term heading represent in GPS?
3. What does the term bearing represent in GPS?
4. What instrument in a tablet can be used to implement tilt control?
5. (True/False) The optical encoders we used in class have digital inputs.
6. What is the advantage of having static IP's?
7. Describe how the limit sensors used in this class work.
8. (True/False) The Kalman Filter uses a weighted balance between predictions and measurements dependent on the user's belief of which term is more accurate.
9. What is the danger of driving to the bearing too fast?
10. (True/False) A Kalman Filter value of 1 means you trust your predictions.
1. What Sensor Type is used for Tilt dectection for the Android
2. Define NMEA and the NMEA 0183
3. Define and Explain MAC Address
4. What are the main/major characteristic of an embedded system
5.What are 2 important contstraints in embedded system design.
6. What is an Activity in Android SDK
7. What is a Static IP Address
8. Define Differential GPS
9. What is a socket
10. What does SDCC stand for in embedded systems?
1. (True/False) In order to use the google maps API in a user created application, the permission "android.permission.ACCESS_NETWORK_STATE" needs to be added to the xml layout file of the activity containing the map.
2.What sensor is used on the Android devices for tilt functionality?
3. Without the assumption of the surface of the earth, how many satellites are

needed for GPS calculation?
a. 2
b. 4
c. 3
4. (True/False) TCP is suitable for the actions of when error checking and correction is not necessary or performed within the application.
5. (True/False) The SHA-1 Fingerprint is needed for the process of obtaining an API key for having access to utilize Google Maps in an Android Application.
6. The ad-hoc network on the VEXPro refers to what mode of operation?
a. IEEE 802.11
b. IEEE 802.10
c. IEEE 802.11g
d. IEEE 802.11n
7. (True/False) The CPU on the Nexus 7 tablet is the Quad-core Tegra 4.
8. What does GPS stand for?
9. (True/False) Linux was originally developed as a free operating system for Intel x86 based computers.
10. In Android developing, content providers are able to do what?
a. encapsulate data
b. provide mechanisms for defining data security
c. connects data in one process with code running in another process
d. all of the above

1. T or F: Standard consumer GPS has an error of 10 m.
2. T or F: Batteries last longer in cold weather.
3. What is the difference between heading and bearing?
4. What is another sensor that could be used to accomplish the cliff test besides the ultrasonic sensor?
5. What is the derivative of position?
6. What is the Force equation for an object moving in a circle?
7. What needs to be known before GPS can get a position fix?
8. Explain how to get to the robot to move to a gps location. (various possible answers)
9. Explain a way to autoconfigure the devices. (various possible answers)
10. What was a major problem with getting the robot to move to GPS locations?
a. Accurate heading information
b. Motor speed
c. Turning radius
d. Cloudy weather