1. (True/False) A motor connected to a small gear which turns a large gear attached to a wheel has a higher speed than a motor connected to the same large gear that turns the small gear which is now attached to the wheel.
2. (True/False) An Android device can host an ad-hoc network
3. (True/False) An MP3 player can be considered an embedded system.
4. (True/False) Android is programmed in just C.
5. (True/False) Android requires that you create an XML file to implement a layout?
6. (True/False) Android uses the programming language Java?
7. (True/False) Currently, the accuracy of GPS for civilian applications is more than 10 meters horizontally. That is, the GPS signal may point to a position more than 10 meters away from the actual location.
8. (True/False) Eclipse gives you an HTML code view when programming an Android Application.
9. (True/False) In the CQEMotorTraj class, a negative velocity can be passed to the Move() and MoveVelocity() functions.
10. (True/False) It is possible to debug an android application in real-time both in Eclipse and on the Android device itself.
11. (True/False) On an Android device, GUI and networking code can operate in the same thread.
12. (True/False) Software can usually be written on an Embedded System directly.
13. (True/False) TCP is suitable for the actions of when error checking and correction is not necessary or performed within the application.
14. (True/False) The 2 and 3 wire motors are implemented using the same class?
15. (True/False) The two channels that are used for Wi-Fi in the United States is 2.4 GHz and 5 GHz.
16. (True/False) The type of Hardware used is what makes a system Embedded.
17. (True/False) The Vex Controller hardware is synchronous.
18. (True/False) The VEX microcontroller will automatically connect to a private Wi-Fi network with the strongest signal in the vicinity.
19. (True/False) The VEX uses the programming language Java?
20. (True/False) The VEXPro requires an input voltage of 7.2V.
21. (True/False) With current day technology in GPS, location can be acquired from both satellites and cellular data networks.
22. (True/False) Without ALMANAC data, GPS takes at least five minutes to get a lock
23. 10.(True/False) All Android Activitys must be declared in the AndroidManifest.xml file for them to be used?
24. A new screen in an Android app is called (an):
25. According to the Android SDK, what is an activity?
26. And what is it (PWM) used for with VEX?
27. Are the VEX Bump Sensors interfaced with the Digital or Analog ports on the VEX Pro?
28. Because Android follows a single thread model, it's vital to the responsiveness of your application's UI that you do not block the UI thread. How do you do this in Android?

29. Before the Android system can start an application component, the system must know that the component exists by reading a type of file. What is this type of file called?
30. Can the Android devices connect to Ad hoc network naturally? Explain why?
31. Can the VEX connect to a secure wireless network naturally? Explain why?
32. Communication is being done through what airwaves?
33. Each satellite continually transmits messages to a GPS receiver, what do these messages include?
34. Explain one way to run a user program on the VEXPro
35. For the following function: Int CQEGpioInt::RegisterCallback(unsigned int io, void * userPointer,void(*)(unsigned int, struct timeval *, void *) callback), What is the purpose of the "callback" argument?
36. Google have been using a dual naming/numbering system for their Android OS, what goes with 4.0 and 4.1?
37. How are IP addresses assigned to devices that connect to the same network?
38. How does the Android OS activate activities, services, and broadcast receivers?
39. How many GPS satellites are needed to determine one's position?
40. How many motor ports does the Vex have? What does Baud rate refer to?
41. How many ports are designated for 2-wire motors?
42. How might you make the robot drive in a straight line using sensors? (description or pseudo code)
43. In a server/client setup, besides the IP address of the server, what else must the client know to communicate with the server?
44. In order to program on the Android, you must have an IDE and what other tool?
45. In order to start developing Android apps there is a kit that should be installed, What is the name of that kit?
46. In the beginning of this class there was a brief specs comparison between Nexus S and Nexus 7, what is the price and how many processor cores does each have?
47. List 5 examples of embedded systems.
48. Name 2 important constraints when designing hardware or software for an embedded system.
49. Name 3 Unix commands that may be helpful when working with the Vex.
50. Name five protocols of 802.11 and two common frequency bands.
51. Name the four main layout types in an Android Application
52. Name the two sensors that should be used in Project Iteration two
53. Of the two main embedded devices used in this class, Android based platforms and the VEXpro, which languages are they programmed in?
54. Since the VEX is a Linux based microcontroller, when programing in windows what program gives the user the ability to program it in Linux?
55. SSH stands for?
56. The brand name of the Wi-Fi router that Dr. Povinelli uses in class is _____. The password manager that Dr. Povinelli

recommends is _____. Print both answers clearly, separated by a comma.

57. The Netbooks have a GPS in them, but why is it better to use Android's GPS?
58. The Wi-Fi Alliance defines Wi-Fi as any wireless local area network that is based on what standard?
59. There are two types of wireless networks. What are they?
60. What 2 things must a client know about a server it is trying to connect to using TCP?
61. What allows connections between the VEX and Android devices?
62. What are interrupts and polling?
63. What are network sockets and how do they work?
64. What are some advantages and disadvantages of the PIC micro-controller architecture?
65. What are some aspects of C that make it appealing to Embedded Systems?
66. What are some aspects of Java that might make it appealing to program on an Embedded System?
67. What are some examples of I/O that embedded systems include?
68. What are some of the main differences between TCP and UDP?
69. What are the four types of components in an Android application?
70. What are the three major segments that GPS consists of?
71. What are the two rules to Android's single thread model?
72. What are two methods to run user programs on the VEXPro?
73. What are typical target specifications/design constraints for Embedded Systems?
74. What does "Rooting" your phone actually mean?
75. What does CDMA stand for?
76. What does DHCP stand for? What does a DHCP sever do?
77. What does GPS stand for?
78. What does it mean to "root" your android device?
79. What does it mean to have "root" access on a Linux machine?
80. What does PWM stand for and how does it affect the speed of a motor?
81. What does PWM stand for?
82. What does SSH stand for? What is it purpose? What is the standard TCP port number for SSH client/servers?
83. What does UART stand for?
84. What does USART stand for?
85. What hardware does the netbook use to communicate to the Vex?
86. What is "802.11"?
87. What is a callback function in relation to interrupts?
88. What is a drawback of using pulling for sensors verses interrupts?
89. What is a socket? What are sockets used to accomplish?
90. What is a socket? Give an example of one in use.
91. What is a USART?
92. What is accomplished by the following line of code, assuming io is an instance of CQEGpioInt: bool isOn = !(io.GetData() & 0x0001);
93. What is an embedded system? List three examples of devices that contain embedded systems.
94. What is an IDE? How are IDE's related to Embedded systems?
95. What is IEEE 802.11?

96. What is IEEE standard number for Wi-Fi protocols?
97. What is port 22 used for?
98. What is SDCC an acronym for in relation to Vex programming?
99. What is SSH?
100. What is Terk IDE programing API for the VEX called? What purpose does it serve and why is it important?
101. What is the API packaged in the Terk IDE?
102. What is the average accuracy of standard GPS? What is the technique mentioned in class that can improve accuracy? Give a brief description of how it works.
103. What is the command with Linux's command line that allows permissions access?
104. What is the course number for Embedded Systems class? What is the name of the C/C++ compiler for the VEXPro ARM9 controller that is utilized in the TerkIDE?
105. What is the difference between a servo motor and a drive motor?
106. What is the difference between polling and interrupts?
107. What is the difference between the L1 and L2 frequency transmitted from a typical Satellite Vehicle?
108. What is the difference between the vex optical and an ultrasonic sensor?
109. What is the easiest way to disable a robot?
110. What is the factor that influences GPS accuracy the most?
111. What is the formula for evaluating project task risks? What is the scale for high versus low risk?
112. What is the highest bit rate that the Vex can communicate through the serial port?
113. What is the instruction and switch for programming the Vex under Linux?
114. What is the language that Android uses to define the layouts of applications?
115. What is the latest version of the Android operating system?
116. What is the latest version of the Android OS and a major improvement it has from previous versions?
117. What is the main difference between Xubuntu and Ubuntu Oss?
118. What is the name of the Android class that best satisfies the following description? "_____ is a view group that aligns all children in a single direction, vertically or horizontally. You can specify the layout direction with the android:orientation attribute."
119. What is the name of the API used to program the VEX?
120. What is the name of the mechanism by which the 2-wire motors are able to report information about their motion to the VexPro?
121. What is the name of the method that initializes an Android activity?
122. What is the name of the operating system running on the Vex?
123. What is the name of the VEX OS?
124. What is the name of the VexPro API?
125. What is the PIC18F8520?
126. What is the process by which data is collected from the bumper sensors and interpreted on the VEXpro?
127. What is the processor used in the VEXPro?
128. What is the range (indoor and outdoor) of a Wi-Fi network with a typical wireless access point?

129. What is the root password for the VEXPro?
130. What is the specific OS running on the VEXPro?
131. What is the SSH password for the root account on the Vex?
132. What kind of processor does the Vex use?
133. What language are most android applications developed in?
134. What language is the Android projects written in?
135. What language is the VEXPro projects written in?
136. What Linux distribution is Ubuntu based on? What does the word mean?
137. What movie did we watch a clip from? How would you view the current IP address of the Vex?
138. What networking port is most often used for hypertext transfer protocol?
139. What object in c library do you call to open communication between the VEXPro and Android?
140. What processor does the VEXPro use?
141. What programming language does the Android App Development utilize?
142. What programming language is primarily used to program Android applications?
143. What programming language is primarily used to program on the Vex microcontroller?
144. What resources are available from the libqwerk website?
145. What statement is used to make a Vex program run continuous?
146. What two types of motors are available for the VEX?
147. What type of microcontroller system does the VEX use?
148. What type of processor architecture does the ARM9 have and how many bits are there per register? How many stages does the pipeline have?
149. What underlying IDEs are used by both the Android SDK and the TerkIDE?
150. What was the first satellite navigation system called and who was it used by?
151. When the VEXPro receives commands, is it the client or server in the client-server communication?
152. When was Linux initially released?
153. When will robots take over the world? And how will they do it?
154. When you start a new Android Application Project in Eclipse with ADT, there are 3 default string variables in the "strings.xml" file in the directory "/res/values". Their names are: app_name, action_settings, and _____.
155. Where might I go to learn the basics of Android programming?
156. Which Mythbuster has worked with VEX?
157. Why couldn't we use the controller as part of Project 1?
158. Why do we use a different compiler than the common gcc compiler for programming the Vex?
159. Why might allowing interrupts cause problems?
160. Why might it be a bad idea to use an ad-hoc network for communication between the Vex and Android?
161. Why should you not use a servo to drive the wheels?
162. Without an almanac, how long does it take to get a fix on the GPS satellites
163. Is a bumper a
    a. Digital Input

b. Analog Input

164. Do we connect from Android to Vex using
   a. UDP
   b. TCP
   c. Either
165. What is the proper way to initialize an instance of the CQEGpioInt class?
   a. CQEGpioInt io = CQEGpioInt.new();
   b. CQEGpioInt *pio = CQEGpio::GetPtr();
   c. CQEGpioInt &io = CQEGpioInt::GetRef();
   d. Both b and c
166. How many “Smart” 2-wire Motor Ports does the VEXPro have?
   a. 4
   b. 8
   c. 12
   d. 16
167. What represents a single screen with a user interface in an Android application?
   a. Intent
   b. Activity
   c. View
   d. Content Provider
168. Select the sentence that is NOT true about Android Services.
   a. A service can run in the background to perform work even while the user is in a different application.
   b. A service can allow other components to bind to it, in order to interact with it and perform interprocess communication.
   c. A service runs in the main thread of the application that hosts it, by default.
   d. A service can move into the background and then be resumed with their state restored.
169. What represents a behavior or a portion of a user interface in an Activity?
   a. Toast
   b. View
   c. Fragment
   d. Intent
170. What level grade was the robot in Project Iteration one supposed to overcome?
   a. 30%
   b. 20%
   c. 10%
   d. 15%
   e. 5%
171. How many satellites must be visible to obtain an accurate result in GPS operations?
   a. 1
   b. 4
   c. 2
   d. 6
172. Android is based on what operating system?
   a. Windows
   b. Linux
   c. MAC

173. What is the formula for Total Risk?
    a. Total Risk = Points(%)/(Time(hours)*Risk)
    b. Total Risk = Time(hours)/(Risk*Points(%))
    c. Total Risk = Risk*Points(%)/Time(hours)
174. What command must be done at the beginning of the Vex program?
    a. autonomous_mode_init()
    b. controller_init()
    c. robot_init()
175. What is ideally used to open Server and Client sockets in the Android code?
176. Which of the following is not a property of UDP?
    a. UDP is faster than TCP
    b. UDP does not send an acknowledgement packet
    c. Packets are sent as a data stream (instead of individual packets)
    d. UDP is connection-oriented
177. Which of the following is the primary problem for ad hoc networks?
    a. They require a preexisting infrastructure (router or access point)
    b. Members of the network compete for access resulting in collisions
    c. Ad hoc networks are difficult to set up
    d. Ad hoc networks do not scale well
178. What is the method used to gain more accurate results from GPS?
    a. Differential GPS
    b. GPS triangulation
    c. Assisted GPS
    d. Augmented GPS
179. What is the default shell of the VEXpro?
    a. Bourne shell
    b. C shell
    c. Busybox
    d. Perl shell
180. Unix-like operating systems label serial ports as what?
    a. COM ports
    b. TTY ports
    c. MIDI ports
    d. RS232 ports
181. The VexPro microcontroller uses which processor?
    a. ARM9
    b. ARM Cortex M3
    c. ARM Cortex A9
    d. ARM Cortex R7
182. Rooting the Android device enables what?
    a. Access to the Android file system
    b. Run applications outside of the Google Play Store
    c. Installing a custom operating system
    d. Applications having root privileges
183. Which of the following is a problem with the Marquette wireless networks?
    a. It does not use authentication
    b. It does not have an authentic CA certificate
    c. It lacks all encryption

d. Nothing is wrong with the networks

184. What set of ports should a bumper sensor be connected to?
a. Motor
b. Analog
c. Serial
d. Digital

185. When creating an Android application, what is the file extension on the files for creating an app's layout?
a. .java
b. .jar
c. .dex
d. .xml

186. The defining aspect of an ad-hoc network is that it does not rely on pre-existing _____?
a. infrastructure
b. network
c. programs
d. files

187. In the CQEMotorTraj class, what does the parameter "unsigned int axis" refer to in the function, MoveVelocity (unsigned int axis, int velocity, unsigned int acceleration)?
a. 12 standard motor ports on the VEXPro microcontroller
b. 16 digit i/o ports on the VEXPro microcontroller
c. 4 smart motor ports on the VEXPro microcontroller
d. 16 analog ports on the VEXPro microcontroller

188. 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

189. The VEXPro microcontroller has 12 standard _____ motor ports and 4 smart _____ motor ports?
a. 2-wire, 3-wire
b. 3-wire, 2-wire
c. 2-wire, 1-wire

190. Which of the following statements about TCP and UDP is true?
a. UDP is connectionless while TCP is connection based
b. UDP is slower than TCP
c. UDP packets have larger headers than TCP packets
d. TCP is less reliable than UDP

191. Which method of checking I/O input ports reduces CPU cycle overhead?
a. Polling
b. Interrupts
c. Peeking
d. Scanning

192. How many general purpose digital I/O ports does the VexPro have?
a. 8
b. 10
c. 12
d. 16

193. 10.What is the accuracy of the GPS in your phone?
a. 1 meter
b. 10 meters

c. 100 meters
d. 1000 meters

194. What does ADT stand for?
a. Android Design Tools
b. Android Development Test
c. Android Developer Tools
d. Android Developer Toolkit
e. Android Design Toolkit

195. When you attempt to connect to the VEX microcontroller from a web browser, you are prompted for a username (i) and password (ii). When you use SSH to access the VEX microcontroller, you are also prompted to provide an id (iii) and password(iv). Which of the following statements is true?
a. (ii) and (iv) are equal to each other
b. (i) and (ii) are equal to each other
c. (i) is "root"
d. (iii) is "admin"
e. (iv) is "qwerk"

196. To enable USB debugging on an Android device running Android 4.2 and newer, you must first enable the hidden "Developer options" menu by going to "Settings > About phone" and tapping "Build number" ____ times. This only needs to be done once per device.
a. three
b. five
c. six
d. seven
e. nine

197. Which of the following is NOT an example of an embedded system?
a. Nexus 4
b. Vending machine on the second floor of Engineering Hall
c. Digital clock
d. Microwave
e. Bluetooth headset
f. f. All of the above
g. g. None of the above

198. When the bumper switch is pressed, it triggers a _____ signal on the Digital IO port.
a. Low (Negative Edge)
b. High (Positive Edge)
c. Other

199. The VEXPro Microcontroller has ___ Fast Digital I/O ports.
a. 4
b. 8
c. 16
d. 32

200. If a small gear is placed on the shaft of a motor and is joined to a large gear on the shaft of a wheel. What relative torque and speed does this gear ratio produce?
a. Medium Speed, Medium Torque
b. High Speed, Low Torque
c. Low Speed, High Torque
d. High Speed, High Torque

201. What type of compiler does the Terk IDE use to compile code to be run on the VexPro?

a. Embedded Compiler
b. Cross Compiler
c. Optimizing Compiler
d. Just-in-time Compiler

202. Which provides more torque:
a. A big gear driving a little gear
b. A little gear driving a bigger gear