Final Exam Questions

1. What are three characteristics of embedded systems?
2. What are 3 common design metrics for embedded systems?
3. List the benefits and drawbacks of the PLD:
4. Offer at least one financial reason why embedded systems are so prevalent in today's world, from a financial standpoint.
5. What are the 4 phases of the RUP?
6. What are 7 examples of Embedded Systems?
7. Give a short explanation for the three key technologies for embedded systems.
8. Provide an overview of C# and its features.
9. Which term is not specific to communication protocol from the list below?

   - Port
   - Delegate
   - Socket
   - TCP

9. What are the main restrictions in developing a GUI using the .NET Compact Framework?
10. What does RUP stand for?
11. Define time-to-market and give the average time-to-market constraint.
12. List 5 examples of embedded systems.
13. Define the frequency-hopping spread spectrum.
14. List and describe the two Bluetooth stacks.
15. Define IEEE 802.11 technology and name the 3 frequency bands it operates in.
16. The NetworkStream Class constructor takes 3 parameters. What are they?
17. What does WPAN stand for?
18. List the 3 key technologies for embedded systems.
19. What documents are included into a RUP Phase X Report (where X is replaced by the current phase number)?
20. What does Moore's Law state?
21. What does RUP stand for?
22. List one thing that is not in the .NET Compact Framework.
23. _____is similar to an interface, but specifies just one signature for a single method.

   - Delegate
   - Driver
   - Replicate
   - Subscriber

24. _____ is the name of an ad-hoc Bluetooth network formed by a master and its slave(s).

- Micronet
- Mininet
- Nanonet
- Piconet

25. How many active devices can a piconet contain?

26. True or False: Both TCP and UDP allow multicast delivery.

27. What are three characteristics of embedded systems?

28. What are 3 common design metrics for embedded systems?

29. When designing an application for an embedded system using Microsoft's Compact .NET Framework, of what aid to you is the debugger?

30. What version of the OS is running on the iPAQ?

31. _____ is the name of an ad-hoc Bluetooth network formed by a master and its slave(s).

- Mininet
- Micronet
- Nanonet
- Piconet

32. Give four examples of embedded systems

33. What is "Moore's Law?"

34. What does RAD stand for?

35. What does RUP stand for?

36. What are the four phases of the RUP?

37. True or False: Personal Computers are the most common type of computer used today.

38. True or False: there are more embedded processors produced every year than desktop processors.

39. What does PAN stand for?

40. List 6 embedded devices.

41. What are some characteristics of embedded systems that differentiate them from standard "desktop" computer systems?

42. What version of the OS is running on the iPAQ?

43. What is the difference between non-reoccurring engineering (NRE) cost and unit cost?

44. How does adding designers to a team generally affect the completion time of a project?

45. Which of the following are benefits of a single purpose processor? (select all that apply)

- Fast
- Low Power
- Flexibility
- Small Size

46. What are three types of IC technology?

47. What are the pros and cons of using IC technology?
48. What is Moore's law?
49. What are some restrictions on the System.Windows.Forms Namespace in the .NET Compact Framework?
50. Give three common characteristics of embedded computing systems and briefly describe each.
51. List five examples of embedded systems.
52. List five common design metrics of embedded systems.
53. C# on the .NET platform uses garbage collection to manage program memory.
54. List and define the three key technologies of embedded systems.
55. What are the features and benefits of general-purpose processors, single-purpose processors, and application-specific processors?
56. How are mobile devices different from PCs?
57. The notion of a Windows Form is existent in both the standard .NET Framework and the .NET Compact Framework.
58. List two different ways of using Visual Studio and C# to execute and debug .NET projects for Windows Mobile devices.
59. The Vex Programming cable can also act as a standard serial cable through which any data can be sent.
60. The HCI is part of the Bluetooth Software Stack. What does HCI stand for, and what is it used for?
61. How do you set up a NetworkStream object between an iPAQ and a PC?
62. Which of the following is NOT supported by the .NET Compact Framework?

    - .NET Remoting, support for printing, and XAML
    - Ngen.exe, serialization, and Reflection.Emit
    - The System.CodeDom namespace, Silverlight, and internet deployment
    - The Common Language Runtime, web forms, and XPath

63. There is an 'X' button in the taskbar for most .NET Compact Framework programs. How does this 'X' compare with the 'X' in Windows programs?
64. Many of the Form elements are not supported in the .NET Compact Framework since they are or require keyboard operations. Name 5 of these elements.

65. Label the following Form Controls with S if they are supported in the .NET CF, and U if they are unsupported in the .NET CF.

Controls	S/U
Bounds	
Click	
Color Dialog	
Context Menu	
Hide	
Rich Text Box	

66. Provide 5 examples of embedded systems.
67. What are several constraints of embedded processors?
68. The Common Language Runtime is an important component of the .NET Compact Framework. What is the Common Language Runtime used for?

   - As an intermediate language between the source code and the native code of the underlying hardware.
   - To add an additional level of complexity into the implementation.
   - To convert the compiled intermediate language into native code of the underlying hardware.
   - To convert all source code into a common language.

69. It is important to set the encoding correctly when conducting network transfers. Why is encoding so important?
70. What kinds of encoding are supported in the .NET Compact Framework?
71. List 5 examples of embedded systems.
72. List some common characteristics of embedded systems.
73. What is Moore's law?
74. What are some restrictions on the System.Windows.Forms Namespace in the .NET Compact Framework?
75. True of False: The .NET Framework supplies garbage collection.
76. What are the four phases of the RUP?
77. The RUP is a process made by whom?
78. What is the difference between non-reoccurring engineering (NRE) cost and unit cost?
79. Which of the following are benefits of a single purpose processor? (select all that apply)
80. What are three types of IC technology?
81. What is the relationship between unit cost and NRE cost? Describe when you would accept a higher NRE cost and when a lower NRE cost is more appropriate.

82. Describe the tradeoffs between designing a system with a general purpose processor, like an Intel chip, and designing a system with a single purpose processor.

83. What are the main restrictions in developing a GUI using the .NET Compact Framework?

84. What is the difference between a use case and a scenario?

85. In C#, how does a thread control a GUI that it does not control.

86. Describe the topology of a Bluetooth piconet. How many devices are part of the system? How are they identified? How is data transfer handled?

87. Bluetooth and 802.11 Wi-Fi share the same band frequency 2.4 GHz. How does Bluetooth mitigate interference from Wi-Fi?

88. What are two advantages of Frequency Hopping in Bluetooth?

89. How is the ideal range for Bluetooth connectivity? (i.e. how far can Bluetooth devices transmit data?)

90. Explain how Streams make reading data from a source asynchronous?

91. Microsoft .NET provides the System.Net.Socket namespace for creating sockets. What is a socket? How many sockets need to be created to establish a connection?

92. Explain what NREC is and what it stands for. Is it ever appropriate for NREC to be extremely high? If so, when?

93. The .NET framework has within it a Stream class. Explain what a Stream does.

94. Explain the difference between general purpose processors, single purpose processors, and application specific processors. Give at least one pro and con of each.

95. What are the three primary characteristics of an embedded system?

96. It is often considered that three key technologies drive the embedded system world. What are these three technologies? Define them.

97. Give a definition for garbage collection. Does C# use garbage collection?

98. List three capabilities of the debugger in Visual Studio 2008.

99. The Osborne 1 and the Compaq Portable were both mobile computers released in the early 1980s. Even though the Osborne 1 was much cheaper and lighter than the Compaq Portable, its company went bankrupt not long after the computers release due to one key difference between the two systems. What was that key difference and why does it matter to new computing systems?

100.   Explain the concept of an Event in the .NET framework. Give 3 events one would be likely to see on a form based .NET application.

101.   What did Dr. Povinelli suggest was a good practice in I/O programming?

- leave it to the professionals
- surround code with a try/catch block
- write a record of all I/O executions to the system output stream

102.   From the list below, which term is not specific to communication protocol?

- Delegate
- Port
- Socket
- TCP

103. Which statement below best describes a C# delegate?

- A C# delegate always requires operator overloading.
- A C# delegate is a cross-channel operation in most forms of communication protocol that represents an e availability to receive data.
- A C# delegate is a type that references a method.
- A C# delegate is any UN employee.

104. The C# substitution for Java's "import" keyword is:

- Extract
- Intermingle
- Referencing
- Using
- Utilizing

105. Which snippet of code is most appropriate for creating a Socket capable of TCP communication over Ethernet in C#?

- Socket cS = new Socket(AddressFamily.InterNetwork,SocketType.Stream,ProtocolType.Icmp);
- Socket cS = new Socket(AddressFamily.InterNetwork,SocketType.Stream,ProtocolType.Tcp);
- Socket cS = new Socket(AddressFamily.Tcp,SocketType.Stream,ProtocolType.Tcp);
- Socket cS = new Socket(AddressFamily.Tcp,SocketType.Stream,ProtocolType.Udp);

106. True or False: The .NET Compact framework is a subset of the standard .NET framework, but also contains additional library entities specific to mobile device platforms.

107. True or False: The time spent determining requirements of a project comes to an absolute stop after the first phase of the project is completed.

108. The term "asynchronous" best describes

- A communication configuration where packets can be received without blocking
- A necessary condition for operator overloading
- Parameterless constructors in .NET
- All of the above

109. True or False: Asynchronous communication is practical in situations where device transmission is ALWAYS dependent upon the previously received message.

110. What direct benefit does using AsyncCallback in your communication code provide?

- Allows packets to be received without blocking
- Allows packets to be received without threading
- Provides error handling of communication exceptions
- Reduces connection latency
- Utilizes extension feature of TCP protocol to replicate received data in a future transmission to remote de
- All of the above

111. Define three of the five terms: IP Host Entry, IP Address, TCPListener, Socket and TCP Client. Include one coding example for one of the terms defined.

112. Define Bluetooth profile. Name and explain a few Bluetooth profiles.

113. What are the two essential elements of the platform for .NET and briefly one of the elements?

114. Provide an overview of C# and its features.

115. Below is code written in Java to handle exceptions. Write it in C# to handle the same exception.

```
Java Code:

try {

    foo ( );

} catch (IOException f){

} catch (Exception e) { …}

 finally {

}
```

116. Explain the various memory management schemes and the pros and cons of each.
117. What is stream? Provide a sample code and define buffer, offset and count as it relates to stream.
118. What are some unsupported debugger features?
119. What is a network stream class?
120. Dealing with Asynchronous Read/Write, what happens with this code?

```
int Count = myNetworkStream.Read(buffer,0, buffer.Length);

MessageBox.Show("Data received");
```

121. And what if we want the user interface requests while the stream is being read?
122. True or False: C# employs the using keyword to import software packages
123. How do mobile devices and PCs differ?
124. What is Moore's law?
125. List several different kinds of processors:
126. What is garbage collection and does c# support it?
127. Common embedded design metrics:
128. What is a C# Delegate?
129. List 5 examples of embedded systems.
130. Show the delegate declaration for a function that accepts an integer and a string and returns void.
131. How could automated testing enhance the ability to test code?
132. Automated unit testing allows for dynamic changes to the code where the Test Suite can be re-run to ensure that all tests still pass.