



FREIE UNIVERSITÄT BOZEN
LIBERA UNIVERSITÀ DI BOLZANO
FREE UNIVERSITY OF BOZEN · BOLZANO

Fakultät für Informatik

Facoltà di Scienze e tecnologie informatiche

Faculty of Computer Science

MobileServices

Written Examination

July 3rd, 2009

FIRST NAME		LAST NAME	
STUDENT NUMBER		SIGNATURE	

Instructions for students:

Write First Name, Last Name, Student Number and Signature where indicated. If not, the examination can not be marked.

Do not speak to any other student during the examination. If you speak to another student, your examination will be cancelled.

Use a pen, not a pencil.

Write neatly and clearly.

1. What are the possible states of a MIDlet?
2. After the MIDlet constructor is called what is the state of the MIDlet?
3. What are the possible `Displayable` classes that you can instantiate in a MIDlet?
4. Is `setCurrent()` a method of `Display` or of `Displayable`?
5. Is `addCommand(Command cmd)` a method of `Display` or of `Displayable`?
6. Why you must specify the command **type** parameter when you add a command? How the MIDlet uses this parameter?
7. When you define a `CommandListener` in your MIDlet, what are the methods of this interface that you must implement?
8. `setLayout()` is a method of `Item` or `Form`?
9. `RecordEnumeration enumerateRecords(RecordFilter filter, RecordComparator comparator, boolean keepUpdated)` is a method of `RecordStore`.
What is the role of the `filter` and `comparator` parameters?
10. Business to consumers (B2C) is a kind of ecommerce. Describe other two types of ecommerce providing an example (web site) for each of them.
11. List three important drivers, i.e., factors that are pushing the development, of mCommerce.
12. What is the difference between “sale force automation” and “field force automation” applications?
13. List three potential barriers (limiting factors) to the development of mobile commerce.
14. What is the “connection interface hierarchy” and what are the benefits of using such hierarchy? Make two examples of connection interfaces belonging to this hierarchy.
15. What is the length of an electromagnetic wave with frequency 10GHz?
16. What is the first harmonic of a signal? For instance, if you have a signal whose duration is $5 \cdot 10^{-3}$ secs, what is its first harmonic?
17. State the Nyquist sampling theorem.

18. Assume that you are using 8 symbols and a bandwidth of 5MHz ($5 \cdot 10^6$ Hz). Let further assume that there is no noise on the channel. What is the theoretical maximum data transfer available in bits per second?
19. If the signal to noise ration S/N is 1 what is the new maximum data transfer rate in the previous case, i.e., with 8 symbols and a bandwidth of 5MHz?
20. How many satellites are required for a GPS receiver to compute its location? Consider the case where the GPS receiver has or not a clock error, and explain the answer.
21. Why GSM is not a convenient technology for data transfer, and GPRS has been introduced?
22. What types of MAC techniques is GSM using? Explain briefly how they are used.
23. With respect to the ISO/OSI Network Model, what are the layers that differ in a wired and wireless network? Consider for instance the case of a laptop connect trough WiFi (wireless) or Ethernet (wired).
24. Imagine that three terminals (A, B, C) want to communicate with three peers (A', B', C') using CDMA (A with A', B with B' and C with C'). Write three 6-bits long useful chip codes for enabling the communication of these three pairs if all of them are using the same frequency. Remember that chip codes are vectors with +1 or -1 entries. Explain what is the property that there three chip codes must have.
25. Draw a scenario where A is hidden for B, B is hidden for C, C is not hidden for A and B. Place the three devices on some points and draw a circle around a device to show its transmission range.