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Reseaux Mobiles: Quick Quiz 2 (GSM1)

1. [3] Which types of multiple access does GSM use (tick all which apply)?
 - a. FDMA
 - b. TDMA
 - c. CDMA
2. [2] The primary GSM 900MHz band contains carriers from 890-915 MHz and 935-960MHz.
 - a. What is the difference in purpose for these two allocations? Uplink and downlink directions
 - b. What is the reason for the 20MHz gap between the two allocations? To allow a filter to reduce duplex interference
3. [2] Each 200kHz GSM carrier is divided into timeslots of 15/26ms, into which a “normal burst” of 116 information bits is sent in two blocks of 58 bits with 26 bits in the middle. What is the purpose of these 26 “midamble” bits? Training sequence
4. [2] Which channels are used for the GSM Mobile to establish time and frequency references? SCH and FCCH
5. [1] What does the BCCH send? Broadcast signalling (control) information
6. [1] A GSM traffic channel uses a 26 cycle multiframe (each cycle contains 8 bursts). How many cycles in the common channel multiframe?
 - a. 13?
 - b. 17?
 - c. 51?
7. [1] Every 13th cycle of the half rate (TCH/H) traffic 26 cycle multiframe contains data for what purpose?
 - a. SDCCH?
 - b. SACCH?
 - c. FACCH?
 - d. TCH/F?
 - e. RACH?
8. [1] What does the stealing flag indicate has been stolen?
 - a. Speech?
 - b. Data?
 - c. Speech or data?
 - d. Slow signalling?
 - e. Fast signalling?
9. [1] GSM mobiles offset transmission bursts from reception bursts to avoid:
 - a. Co-channel interference?
 - b. Adjacent channel interference?
 - c. Duplex interference?
10. [2] The 25x51 multiframe superframe is to allow time for the mobile to: (>1 response possible)
 - a. Scan adjacent cells?
 - b. Listen to broadcast information?
 - c. Send multiple RACH requests?
 - d. Have a cup of coffee?

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11. [2] A mobile receives a signal at -77dBm in presence of noise at -94dBm. What is the ratio S/N? (you may use the graph below). $\underline{S/N=10^{d/10}=10^1 10^{0.7}=50}$
12. [2] A GPS signal is received at 2.5% of the noise level of 8fW (8×10^{-15} W). What is the received signal level in dBm? $\underline{Rx_{lev}=10\log_{10}(0.025 \times 8 \times 10^{-12} \text{ mW})=10\log_{10}(2 \times 10^{-13} \text{ mW})=10[\log_{10}(2)-13]=-127\text{dBm}}$

