Test 1: Digital modulations basics

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1) PSK: explain what this acronym means. M-PSK: what does M mean? How many bits contains one QPSK (and one 8-PSK) modulation symbol?

2) M-QAM: explain what this acronym means.
Draw symbol constellation of the 4-QAM (rectangular) modulation.

3) Why can 256-QAM not be used in bad radio conditions? Why is QPSK not used for all communication scenarios?

4) Select correct formula for M-DPSK modulation symbol:
a) $x_k = x_{k+1} \exp(j\phi + j2\pi m/M)$
b) $x_k = x_0 \exp(j\phi + j2\pi m/M)$
c) $x_k = x_{k-1} \exp(j\phi + j2\pi m/M)$
d) $x_k = x_k \exp(j\phi + j2\pi m/M)$

5) Let us we have a communication system with the following parameters of the modem:

- $R_S = 2Mbd$
- 16-QAM

What is the gross bit rate equal?

6) What is the main purpose of the pulse shaping?

7) Is the BER performance of the QPSK and OQPSK different?

8) What is, in general, better in terms of the spectral parameters: QPSK (without pulse shaping), GMSK or MSK?

9) What generation of the mobile communications includes GMSK modulation?

10) Why is M-FSK not so popular in mobile communications?