Design and simulation of communication links using PSK

Expected Outcomes:
To have built communication links using existing PSK modulation and demodulation blocks, constructed PSK modulators using operational function blocks based on their mathematical expressions, and conducted simulations of both links and modulators, all in Simulink.

Key Tasks:

- Generate baseband binary signals and carrier sinewave signals and AWGN noise
- Simulate and evaluate a communications link using BPSK with existing mod and de-mod blocks
- Simulate and evaluate a communications link using QPSK with existing mod and de-mod blocks
- Construct a BPSK modulator with operational function blocks based on the time-domain BPSK expression, and simulate and evaluate the BPSK modulator.

Find out the followings for Tasks 02 and 03:

1. You must measure BER against SNR or Eb/No and plot the performance curves according to the data obtained.
2. For the same noise level, in order to achieve a BER of 10^{-5}, what is the signal power ratio of the BPSK and QPSK links?
3. Therefore, comment on BPSK and QPSK in terms of bandwidth efficiency and signal power required.
4. Show waveforms at different points of the link with different SNR (or Eb/No)
5. Show the constellations of the modulators

Report:

For task-01 report must have the followings:
Diagrams of communication links and modulators, simulated/calculated results and performances such as spectra (frequency domain), waveforms (time domain), analysis and discussions of results.

For task-02 and task-03 report must have the followings:
Signals generated, link and modulator diagrams, simulation results including waveforms, evaluation of results, contrasting between BPSK and QPSK.

Lastly, include the references at the end to show the sources used to gather relevant information on the topic.