BTC Digital principles example questions:

1. Explain what an eye-diagram is and its uses in assessing the performance of digital systems;

2. Explain briefly line coding and its applications

3. In a system without amplifier how does the Q factor relate to the SNR?

4. State how the Q factor is related to the BER.

5. Explain the purpose of a raised cosine filter for NRZ optical signal transmission and its impact on the bandwidth.

6. Explain, briefly, the following:
    a. Intersymbol interference (ISI) and zero ISI signals;

    b. The key sources of noise encountered in optical communication systems;

7. For an unamplified optical system the received signal has rms noise values on zeros and ones of $\sigma_0 = 0.12\ \mu V$ and $\sigma_1 = 0.3\ \mu V$ respectively with the mean zero and one levels being $\langle V_0 \rangle = 0.01 \mu V$ and $\langle V_1 \rangle = 1.2\ \mu V$ respectively.

    i) Sketch the eye diagram and noise distribution at the received

    ii) Calculate the optimum decision threshold

    iii) Determine the extinction ratio

    iv) Determine the signal to noise ratio