Fault-Tolerant Computing

Question 1.

Compare forward error correction (FEC) and backward error recovery (BER) schemes in terms of fault-tolerance capability and cost. (50 points)

Question 2.

Consider an NMR system that produces an 4-bit output. $N=2m+1$ for some m. Each processor fails at a constant rate λ and the failures are permanent. A failed processor produces any of the 2^4 possible outputs with equal probability. A majority voter is used to produce the overall output, and the voter is assumed to be fault-free. What is the probability that, at time t, a majority of the processors produce the same incorrect output after executing some program? (50 points)