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## PROBLEMS SET IV

### PASSBAND DATA TRANSMISSION

**Problem (1-6)** (Haykin, 5<sup>th</sup> edition) 9.4 (a, b), 9.5, 9.6, 9.7 (a, c), 9.15, 9.16.

**Problem (7)** Determine the transmission bandwidth reduction and average signal energy of 256-QAM, compared to 64-QAM.

**Problem (8)** Two passband data transmission systems are to be compared. One system uses 16-PSK, and the other uses 16-QAM. Both systems are required to produce an average probability of symbol error equal to  $10^{-3}$ . Compare the signal-to-noise ratios requirements of these two systems.

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