2.3

$\boxed{\text{dim } n = 8}$

SOFT ???

$$p(E) \le Q\left(\sqrt{\frac{2E_b}{N_0} \cdot R \cdot \text{dim}}\right) \qquad R = \frac{1}{2}$$

$$\frac{1}{2} \cdot 8 = \boxed{4}$$

HARD ???

$$p(E) \le 620 \cdot Q\left(\sqrt{\frac{2E_b}{N_0} \cdot R \cdot 8}\right) + 5208 \cdot Q\left(\sqrt{\frac{2E_b}{N_0} \cdot R \cdot 12}\right)$$

$$R = \frac{1}{2}$$

$$+ \dots$$

$$B_T = \frac{R_c}{2}(1 + \underset{0}{\underline{\underline{\delta}}}) = \frac{R_c}{2} \qquad R_c = \frac{2 \text{ Mbit/s}}{R} = \boxed{4}$$

$$= \boxed{10 \text{ MHz}} \qquad = \boxed{2 \text{ Mbit/s}}$$

c)

$$g(D) = D^{13} + D^{11} + D^{10} + D^9 + D^8 + D^7 + D^5 + D^3 + D^2 + D + 1$$

$$\downarrow$$

$$0000000000000000 \; \underbrace{10001111010111 1}_{g(D)}$$

c) Codeword valid it's a shift of $g(D)$ $\rightarrow \underline{D^2 \cdot g(D)}$

$$y(D) = D^{17} + D^{13} + D^{12} + D^{11} + D^{10} + D^9 + D^7 + D^5 + D^4 + D^3 + D^2$$

$$= D^2 \cdot g(D) \quad \text{divisible per } \underline{g(D)}$$