

## Tentamen TSDT 81 Datatransmission, 2005-10-14

### Lösning 1

*Antipodal:*  $n = 1$ ,  $W_0 = 1/(2T)$ ,  $M = 2$ ,  $R = (1/T) \log M = 2W_0$ . Således:  $(d_E)_0^2 = 4E_b$ ,  $W_0 = R/2$ .

*Biortogonal:*  $n = 4$ ,  $M = 2n = 8 = 2^3$ , varav  $W = n/(2T) = 2/T$ ,  $R = (1/T) \log M = (W/2) \cdot 3 = (3/2)W$ ,  $W = (2/3)R$ ,  $d_E^2 = 2E = 2E_b \log M = 6E_b$ . Således:

$$\beta = \frac{W}{W_0} = \frac{4}{3}, \quad G = \frac{d_E^2}{(d_E)_0^2} = \frac{6}{4} = \frac{3}{2}.$$

### Lösning 2

Anderson 3.5.2, pp 115-119.

### Lösning 3

Anderson Ch 4, speciellt pp 164-165 och pp 171-188.

### Lösning 4

$(u_1, u_2, u_3, u_4) = (1, 1, 1, 1)$ .

### Lösning 5

$d_{free} = 6$ .