1. Output corresponding to bit d1 = [-1,1,-1,1,-1,1,-1,1]

Output corresponding to bit d0 = [1,-1,1,-1,1,-1,1,-1]

2) Sender 2 output = [1,-1,1,1,1,-1,1,1]; [ 1,-1,1,1,1,-1,1,1]

3) d = (-2) x (-1) + 2x1 + 2x1 + 2x1 / 8 = 1

d = 2x1 + 2x1 + 2x1 + (-2)x(-1) / 8 = 1

4) Sender 1 encoding

CDMA (1,1,1,-1,1-1,-1,-1)

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Data Bits (d) | 1 |  |  |  |  |  |  |  |
| CDMA code () | 1 | 1 | 1 | -1 | 1 | -1 | -1 | -1 |
| Output (Z)=(d) x () | 1 | 1 | 1 | -1 | 1 | -1 | -1 | -1 |

Sender 2 encoding

CDMA (-1,-1,1,1,1,1,1,-1)

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Data Bits (d) | 1 |  |  |  |  |  |  |  |
| CDMA code () | -1 | -1 | 1 | 1 | 1 | 1 | 1 | -1 |
| Output (Z)=(d) x () | -1 | -1 | 1 | 1 | 1 | 1 | 1 | -1 |

Output signal

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| (Z) | 1 | 1 | 1 | -1 | 1 | -1 | -1 | -1 |
| (Z) | -1 | -1 | 1 | 1 | 1 | 1 | 1 | -1 |
| Z\*= (Z)+(Z) | 0 | 0 | 2 | 0 | 2 | 0 | 0 | -2 |

Recovering bits sent by sender 1

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Received Signal | 0 | 0 | 2 | 0 | 2 | 0 | 0 | -2 |
| CMDA code (c) | 1 | 1 | 1 | -1 | 1 | -1 | -1 | -1 |

d=

= = =.75

Recovering bits sent by sender 2

Recovering bits sent by sender 1

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Received Signal | 0 | 0 | 2 | 0 | 2 | 0 | 0 | -2 |
| CMDA code (c) | -1 | -1 | 1 | 1 | 1 | 1 | 1 | -1 |

d=

= = =.75

5) (problem 8)

a)1 message, 2 slots

b)2 messages, slot

c)1 message, slot

d)(multi-section)

a)1 message, 2 slots

b)2messages, slot

c)2 messages, slot

e)(multi-section)

a)1 message, 4 slots

b)2 messages, 2 slots

c)1 message, 2 slots