11001000 10010101 1010000**1**

11001000 10010101 1011000**0**

11001000 10010101 1010000**1**

11001000 10010101 1011110**1**

10101010 10010101 1010000**0**

11111110 10010101 1010000**1**

11001000 10010101 1010000**1**

11001000 10010101 1010000**1**

11001000 10010101 1011111**1**

11001000 10010101 1111111**0**

11001000 10010101 1010000**0**

11001000 10010101 1111000**1**

10000000 10010101 1010000**0**

11001000 10010101 1010101**1**

11001000 10010101 1110110**1**

11001000 10010101 1010100**0**

11001000 10010101 10100001

11001000 10010101 10110001

11001000 10010101 10100001

11001000 10010101 10111101

10101010 10010101 10100000

11111110 10010101 10100001

11001000 10010101 10100000

11001000 10010101 10100001

11001000 10010101 10111110

11001000 10010101 11111111

11001000 10010101 10100001

11001000 10010101 11110000

10000000 10010101 10100000

11001000 10010101 10101011

11001000 10010101 11101101

11001000 10010101 10101001

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| -42 | 83 | 111 | 89 | 4 | 74 | -2 | 73 |
| 27 | 35 | 87 | -24 | 26 | 43 | 30 | 22 |
| -1 | -162 | 87 | -18 | 62 | 99 | 105 | 25 |
| 171 | 15 | -68 | 103 | -80 | -81 | 28 | 119 |
| 45 | 15 | -75 | -56 | 21 | -18 | -82 | 10 |
| -2 | 117 | 62 | 119 | -63 | 62 | -115 | -31 |
| 131 | -34 | -72 | -59 | -118 | 32 | 71 | -161 |
| -33 | 96 | 3 | -126 | -101 | 33 | -123 | 25 |

Dw~~D’

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 162 | 41 | 16 | 81 | 42 | 12 | -20 | -12 |
| 30 | 109 | 13 | 36 | 37 | -16 | 18 | -2 |
| -94 | -60 | 12 | -59 | -22 | 6 | -3 | 7 |
| -39 | -83 | -6 | -22 | -14 | 16 | -2 | 3 |
| -31 | 18 | -6 | -12 | 14 | -6 | 11 | -6 |
| -1 | -12 | 13 | 0 | 28 | 13 | 8 | 3 |
| 4 | -3 | 12 | 6 | -18 | -13 | 7 | 13 |
| -9 | 11 | 8 | -16 | 21 | 1 | 6 | 11 |
|  |  |  |  |  |  |  |  |

IDCT(Dw) =

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 129 | 137 | 148 | 133 | 156 | 133 | 136 | 130 |
| 196 | 182 | 130 | 168 | 139 | 127 | 115 | 116 |
| 240 | 221 | 150 | 189 | 162 | 117 | 130 | 133 |
| 235 | 200 | 128 | 196 | 170 | 129 | 128 | 111 |
| 199 | 154 | 119 | 161 | 153 | 131 | 122 | 121 |
| 193 | 72 | 128 | 161 | 105 | 138 | 112 | 128 |
| 157 | 70 | 135 | 125 | 145 | 156 | 111 | 127 |
| 134 | 104 | 131 | 119 | 112 | 128 | 114 | 125 |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
|  |  | D’ = |  |  |  |  |  |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 129 | 137 | 148 | 133 | 156 | 133 | 136 | 130 |
| 196 | 182 | 130 | 168 | 139 | 127 | 115 | 116 |
| 240 | 221 | 150 | 189 | 162 | 117 | 130 | 133 |
| 235 | 200 | 128 | 196 | 170 | 129 | 128 | 111 |
| 199 | 154 | 119 | 161 | 153 | 131 | 122 | 121 |
| 193 | 72 | 128 | 161 | 105 | 138 | 112 | 128 |
| 157 | 70 | 135 | 125 | 145 | 156 | 111 | 127 |
| 134 | 104 | 131 | 119 | 112 | 128 | 114 | 125 |

| **Chất lượng ảnh (%)** | **PSNR (dB)** | **Ảnh gốc** | **Ảnh sau khi thủy vân** |
| --- | --- | --- | --- |
| 100 | 46.326 |  |  |
| 98 | 44.944 |  |
| 96 | 44.197 |  |
| 94 | 43.590 |  |
| 92 | 43.064 |  |
| 90 | 42.710 |  |