1. How many parity check bits are required for 16-bit data word to detect 2-bit errors and single bit correction using hamming code?

[MCQ]

(A) 5

(B) 6

(C) 7

(D) 8

Ans: A

2. A set of four binary code words are as follows:

000000, 000111, 111000, 111111

Let p be the minimum Hamming distance of the code, and q be the maximum number of bit errors that can be corrected.

Find p and q.

[MCQ]

A   p = 3 and q = 1

B   p = 4 and q = 2

C   p = 6 and q = 3

D   p = 2 and q = 1

Ans: A

3. Given the following code words of a binary code:

1100, 1001, 0110, 0011

Let the minimum Hamming distance of the code be p and let q be the number of errors that can be corrected using this code.

Which of the following is correct?

[MCQ]

A $p = 1$ and $q = 0$

B $p = 2$ and $q = 0$

C $p = 3$ and $q = 1$

D $p = 2$ and $q = 1$

Ans: B

4. Assume that a 12-bit Hamming codeword consisting of 8-bit data and 4 check bits is $d_8d_7d_6d_5c_8d_4d_3d_2c_4d_1c_2c_1$, where the data bits and the check bits are given in the following tables:

Data Bits							
D8	D7	D6	D5	D4	D3	D2	D1
1	1	1	X	0	0	1	1

Check bits			
C8	C4	C2	C1
Y	0	1	0

[MCQ]

A $X = 0$, $Y = 0$

C $X = 0$, $Y = 1$

B $X = 1$, $Y = 0$

D $X = 1$, $Y = 1$

Ans: B

5. Assume that a 12-bit Hamming codeword consisting of 8-bit data and 4 check bits is $d_8d_7d_6d_5c_8d_4d_3d_2c_4d_1c_2c_1$, where the data bits and the check bits are given in the following tables:

Data Bits							
D8	D7	D6	D5	D4	D3	D2	D1
0	1	0	X	1	1	0	1

Check bits			
C8	C4	C2	C1
Y	0	0	1

[MCQ]

A $X = 0$, $Y = 0$

C $X = 0$, $Y = 1$

B $X = 1$, $Y = 0$

D $X = 1$, $Y = 1$

Ans: C

6. Assume that a 12-bit Hamming codeword consisting of 8-bit data and 4 check bits is $d_8 d_7 d_6 d_5 c_8 d_4 d_3 d_2 c_4 d_1 c_2 c_1$, where the data bits and the check bits are given in the following tables:

Data Bits							
D8	D7	D6	D5	D4	D3	D2	D1
1	0	1	1	X	0	0	1

Check bits			
C8	C4	C2	C1
Y	0	1	1

[MCQ]

A $X = 0$, $Y = 0$

C $X = 0$, $Y = 1$

B $X = 1$, $Y = 0$

D $X = 1$, $Y = 1$

Ans: D

7. Given the following code words of a binary code:

 11000, 00111, 10101, 01010

the number of errors that can be detected using hamming code.

A 0   **B** 1   **C** 2   **D** 3

Ans: B