**INDRA GANESAN COLLEGE OF ENGINEERING**

**DEPARTEMENT OF INFORMATION TECHNOLOGY**

 **ASSIGNMENT NO 3**

**Subject : Information Coding Technique**

**Subject Code : IT1301**

**Year/Sem : III / V**

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1. **The generator matrix for (6,3) block code is given below . find tall the code vectors of this code**

 **1 0 0 : 0 1 1**

 **G= 0 1 0 : 1 0 1 0 0 1: 1 1 0**

1. **The parity check matrix of a particular (7,4) . linear block code is given by**

 **1 1 1 0 : 1 0 0**

 **H= 1 1 0 1 : 0 1 0 1 0 1 1 : 0 0 1**

1. **Find the generator matrix (G)**
2. **List all the code vectors**
3. **What is the minimum distance between code vectors**
4. **How many errors can be detected ? hoe many errors can be corrected?**
5. **The parity check matrix of a particular (7,4). Hamming code is given below**

 **1 1 1 0 : 1 0 0**

 **H= 0 1 1 1 : 0 1 0 1 1 0 1 : 0 0 1**

 **Calculate the syndrome vector for single bit errors**

1. **For a systematic linear block code , the three parity check digits C4,C5,C6 are give by**

 **C4= d1+ d2+d3**

 **C5=d1+d2**

 **C6= d1+d3**

1. **Construct generator matrix**
2. **Construct code generated by this matrix**
3. **Determine error correcting capability**
4. **Prepare a suitable decoding table**
5. **Decode the received words 101100 and 000110**
6. **An error code has the following parity check matrix**

 **1 0 1 : 1 0 0**

 **H= 1 1 0 : 0 1 0 0 1 1 : 0 0 1**

1. **Determine the generator matrix**
2. **Decode the received codeword 110110 .comment on error detection and correction capability of this code**
3. **The generator matrix of (6, 3) systematic block code is given by**

 **1 0 0 : 0 1 1**

 **G= 0 1 0 : 1 0 1 0 0 1: 1 1 0**

1. **Find the code vectors**
2. **Find all the parity check matrix**
3. **Find the error syndrome**
4. **The parity check bits of (8,4) block code are generated by**

**C4= d1+d2+d4**

**C5=d1+d2+d3**

**C6=d1+d3+ d4**

**C7=d2+d3+d4**

1. **Find the generator matrix and parity check matrix for this code**
2. **List all the code vectors**
3. **Find the errors detecting and correcting capabilities of this code**
4. **Show through an example that this code detects up to errors**
5. **A generator matrix of (6,3) linear block code is given as**

 **1 0 0 : 1 1 1**

 **G= 0 1 0 : 1 1 0 0 0 1: 0 1 1**

**Determine the dmin for the above code. Comment on error correction and detection capabilities . if the received sequence is 101101 .determine this message bit sequence**

1. **The parity digits of (6,3) linear block code are given as**

 **C4= m1+m2**

**C5=m1+m2+m3**

**C6=m1+m3**

1. **Determine the generator and parity check matrices for the systematic code**
2. **Comment on error detection and error correction capabilities of this code**
3. **If the received sequence is 101101 determine the message word**
4. **Consider a (6,3 linear code whose generator matrix is**

 **1 0 0 : 1 0 1**

 **G= 0 1 0 : 1 1 0 0 0 1: 0 1 1**

1. **Find the all the code vectors**
2. **Find all hamming code and distance**
3. **Find minimum weight parity check matrix**
4. **Draw the encoder circuit**
5. **Consider a (7, 4) linear block code whose generator matrix is given below**

 **1 0 0 0 : 1 0 1**

 **G= 0 1 0 0: 1 1 1 0 0 1 0 : 1 1 0**

1. **0 0 1 : 0 1 1**
2. **Find the all the code vectors**
3. **Find all hamming code and distance**
4. **Find minimum weight parity check matrix**
5. **The parity check bits of (8,4) block code are generated by**

**C4= d1+d2**

**C5=d1+d2+d3**

**C6=d1+d3**

**C7=d2+d3+d4**

1. **Find the generator matrix and parity check matrix for this code**
2. **List all the code vectors**
3. **Find the errors detecting and correcting capabilities of this code**
4. **Show through an example that this code detects up to errors**
5. **The generator polynomial of (7,4) cyclic code is G(P)=p3 +p+1**

**Find all the code vectors for the code in nonsystematic form**

1. **The generator polynomial of (7,4) cyclic code is G(P)=p3 +p+1**

**Find all the code vectors for the code in systematic form**

1. **find out the generator matrix for systematic (7,4) cyclic code if G(P)=p3 +p+1 alsofind out the parity check matrix**
2. **Draw the block diagram of encoder for cyclic codes**
3. **Draw the block diagram of syndrome calculator (n,k) cyclic code**
4. **Construct a systematic (7,4 ) cyclic code using generator polynomial g(x)=x3 +x+1. What are the error correcting capabilities of this code? Construct the decoding table and for the received codeword 1101100 ,determine the transmitted data word**
5. **Determine the encoded message for the following 8 bit data codes using the following CRC generating polynomial p(x)= x4 +x3 + x0 (i) 11001100 (ii) 01011111**
6. **Suggest a suitable generator polynomial for a (7,40 systematic cyclic code and find code vectors for the following data wods**
7. **1010 (ii) 1111 (iii) 0001 (iv) 1000**

**Draw an encoder arrangement for the above code and explain its operation. construct the decoding table for all single bit error patterns and determine the data**

 **Vectors transmitted for the following received vectors**

1. **1101101 (ii) 0101000**
2. **A (15,5) linear cyclic code has a generator polynomial g(x)=1+x+x2 +x4 +x5+x8+x10 draw the block diagram of an encoder and syndrome calculator for this code**

**ON OR BEFORE 7.09.2012**

**ALL THE BEST**