DC/4(b)/Jul/2022

# **EXPERIMENT NO.4(B)**

**TITLE**: **Study of Manchester Coding.**

**OBJECT:**

**a)** To design the circuit

b) To observe the Manchester coded & decoded o/p in the CRO

c) To observe the spectrum in the Spectrum Analyzer & measure the band width of the coded o/p.

**EQUIPMENTS/COMPONENT REQUIRED**:

S. No. ITEM Qnty.

1. Oscilloscope 01
2. Spectrum Analyzer 01
3. Power Supply +5v 01
4. IC 7404 01
5. IC 7486 01
6. Bread board 01
7. Connecting wires

**THEORY :** The theory is given with experiment no 4(a)

**EXPERIMENTAL PROCEDURE:**

1. Connect the circuit on breadboard as shown in fig1.
2. Connect the data from binary data generator at **point A.** andConnect CLK from binary data generator at **point B.**
3. Connect +5v & GND to all the ICs.
4. Also connect GND point from binary data generator to GND connection of bread board.
5. Observe the DATA I/P, Manchester coded signal and decoded wave form on the CRO.
6. Draw all the wave form in graph paper including clock signal.

Also observe the spectrum of signal with SPECTRUM ANALYSER Or **DSO** by using **FFT function**

* **Setting of spectrum analyzer:** i) Set SPAN to 100 kHz/Div, RBW 30 KHz in spectrum analyzer.

ii) Press centre freq button & select centre frequency.

iii) Press marker button to ‘**ON**’ the markers and put the markers in proper position to measure the bandwidth & power.

* **Setting of DSO**: i) Press **MATH/ FFT** button,

ii) From FFT menu select window function and source

iii) Press cursor button and in cursor menu (F1 button) choose source of the cursor ( FFT).

iv) Use horizontal & vertical cursor to measure the band width & power.

**CIRCUIT DIAGRAM:**



**Observations:**

**1.** Draw the CLK pulse, Data, coded & Decoded wave form.

2. Draw the spectrum in another graph & measure the band width.

**WORK SHEET**

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c) .to observe the spectrum in the Spectrum Analyzer & measure the band width of the coded o/p.

**EQUIPMENTS/COMPONENT REQUIRED :**

S. No. ITEM Qnty. Specification

1. Oscilloscope 01
2. Data Generator
3. Spectrum Analyzer 01
4. Power Supply +5v 01
5. IC 7404 01
6. IC 7486 01
7. Bread board 01
8. Connecting wires

**RESULT:**

1. Draw the sample Clock pulse, Data, Coded o/p and Decoded o/p

2. Draw the sample of spectrum of coded o/p

3. Write down the measured bandwidth. Is the measured b/w is theoretically correct? Analyze.

**FURNISH YOUR LAB REPORT WITH:**

1. Name of exp. 2. Objective 3. Brief theory. 4 .Equipment & Component required with specification. 5. Circuit / block

Diagram 6. Work sheet 8. Graph /Wave form/Spectrum 9. Discussion