CLASS: S.E.COMP **SUBJECT :DEL**

EXPT. NO.:5 **DATE:**

TITLE : DIGITAL MAGNITUDE COMPARATOR CIRCUIT

OBJECTIVE :

1. Design and Implement 1-bit Digital magnitude comparator circuit using logic gates
2. Design and Implement 2-bit Digital magnitude comparator circuit using logic gates
3. Verification of function table of IC-74LS85
4. Design and Implement 5-bit Digital magnitude comparator circuit using IC-74LS85
5. Design and Implement 8-bit Digital magnitude comparator circuit using IC-74LS85

APPARATUS :

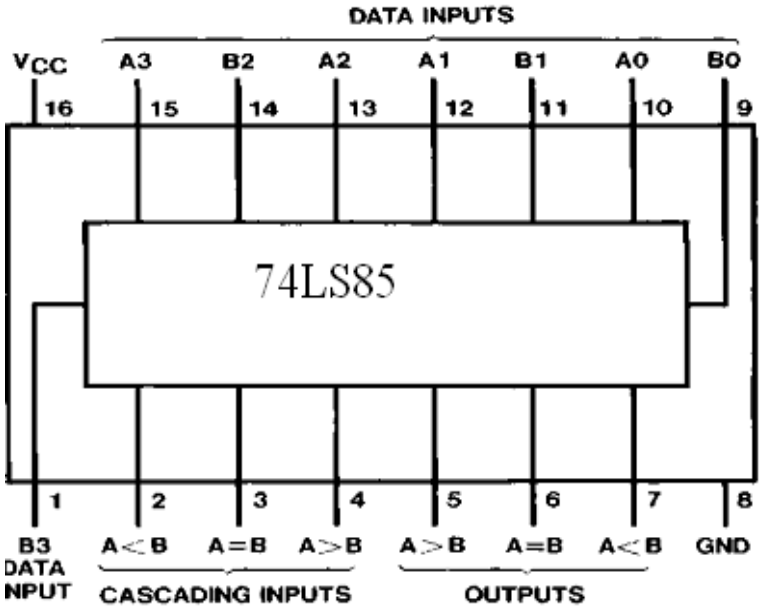
Digital-Board, GP-4Patch-Cords, IC-74LS86, IC-74LS32, IC-74LS08 / IC-74LS04/IC-74LS85 and Required Logic gates if any.

THEORY :

Magnitude Comparator is a logical circuit, which compares two Signals A and B and generates three logical outputs, whether. A > B, A = B, or A < B IC 7485 is a high speed 4-bit Magnitude, Comparator which compares two 4-bit words. The A = B Input must be held high for proper compare operation. These 4-bit magnitude comparators perform comparison of Straight binary or BCD codes. Three fully-decoded decisions about two, 4-bit words (A, B) are made and are externally available at three outputs. These devices are fully expandable to any number of bits without external gates. Words of greater Words of greater length may be compared by connecting Comparators in cascade.

The A > B, A < B, and A = B outputs of a stage handling less-significant bits are connected to the Corresponding inputs of the next stage handling more-significant bits. The stage handling the least significant bits must have a High-leveL voltage applied to the A = B input The cascading path is Implemented with only a two-gate-level delay to reduce overall comparison times for long word

PIN DIAGRAM:



PROCEDURE :

1. Make the connections as per the Logic circuit of 1-bit Digital comparator circuit and Verify its Truth Table.
2. Make the connections as per the Logic circuit of 1-bit Digital comparator circuit and

Verify its Truth Table.

3. Make the connections as per the pin diagram of IC-74LS85 and Verify its Function Table
4. Make the connections as per the Logic circuit of 5-bit Digital comparator circuit and Verify its Function Table
5. Make the connections as per the Logic circuit of 8-bit Digital comparator circuit and Verify its Function Table

Design of 1-bit Digital comparator

Design-Table:

Input		OUTPUT		
A	**B**	**Y1=A<B**	**Y2=A=B**	**Y3=A>B**
0	**0**			
0	**1**			
1	**0**			
1	**1**			

K-Map Simplification for Y1=A<B, Y2=A=B, Y3=A>B

Logic Diagram:

Design of 2-bit Digital comparator

Design-Table:

Dec. Equ.	Input				OUTPUT		
	A1	A0	B1	B0	Y1=A<B	Y2=A=B	Y3=A>B
0	0	0	0	0			
1	0	0	0	1			
2	0	0	1	0			
3	0	0	1	1			
4	0	1	0	0			
5	0	1	0	1			
6	0	1	1	0			
7	0	1	1	1			
8	1	0	0	0			
9	1	0	0	1			
10	1	0	1	0			
11	1	0	1	1			
12	1	1	0	0			
13	1	1	0	1			
14	1	1	1	0			
15	1	1	1	1			

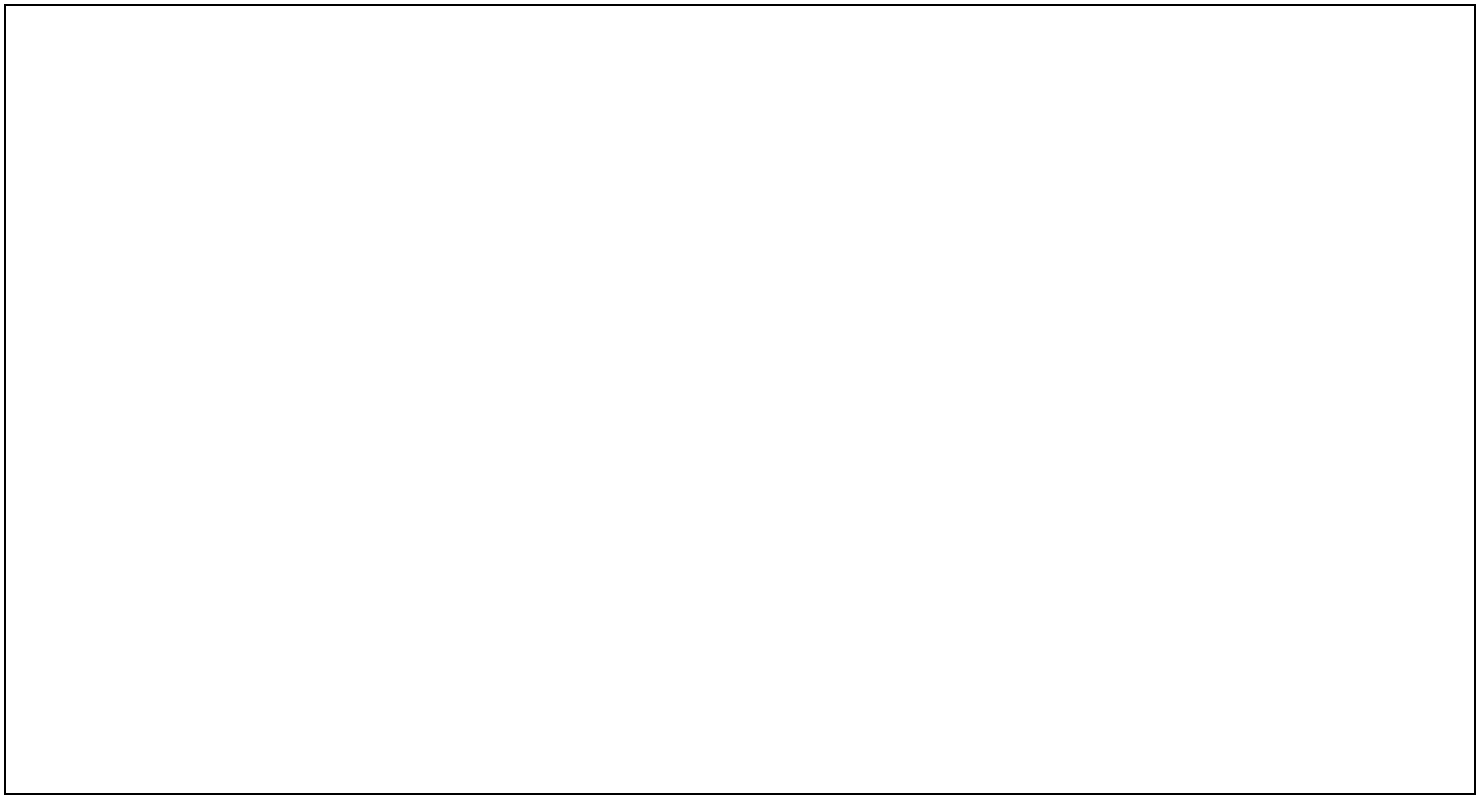
K-Map Simplification for Y1=A<B, Y2=A=B, Y3=A>B

Logic Diagram:

Design using IC-74LS85

Verification of Function Table:IC-74LS85

Design of 5-bit Digital comparator using IC-74LS86



Design of 8-bit Digital comparator using IC-74LS85

Logic Gates / MSI Device required for Implementation:

Sr.No.	Title	Name of the IC	Number of Gates required	IC Required
01	1-bit compartor using logic gates			
02	2-bit compartor using logic gates			
03	5-bit comparator			
04	8-bit comparator			

CONCLUSION:

REFFRENCE:

1. **R.P.Jain "Modern Digital Electronics" TMH 4th Edition**
2. **D.Leach,Malvino,Saha,"Digital Principles and Applications",TMH**

Subject teacher Sign with Date Remark