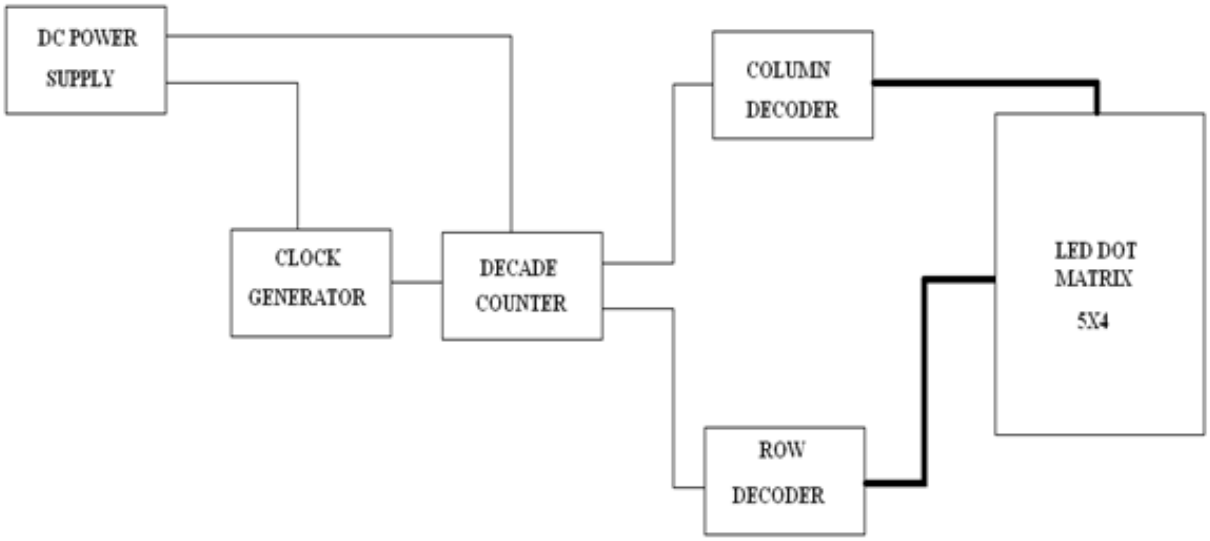
LIGHT EMITTING DIODE DISPLAY

Block Diagram:



The block diagram consists of following blocks i.e. DC power supply, clock generator, decade counter, decoder and LED dot matrix. From the explanation of each block, the DC power supply takes 9V as input and gives regulated output as 5V

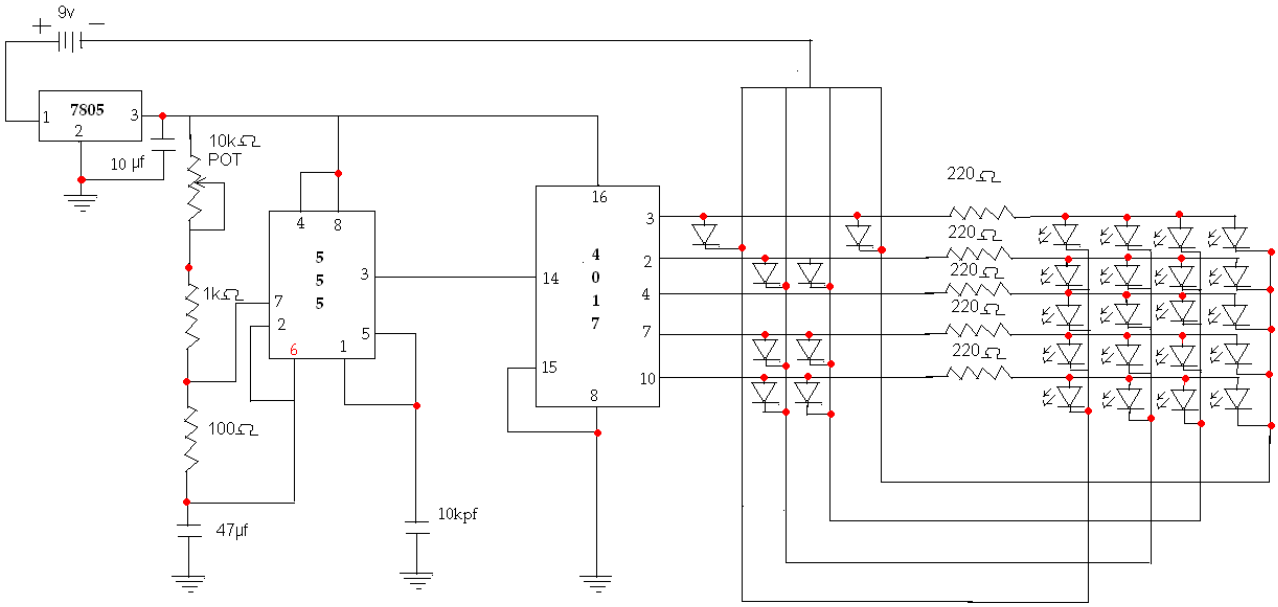
The clock generator consists of 555 IC and operated in astable mode to generate required frequency. The counter block contains flip-flops to count input pulses and gives output in BCD

The Decoder block consists of row decoder and column decoder. Row Decoder is a 3 X 8 decoder and column decoder consists of basic ROM structure. These two are used to select the particular LED's in dot matrix in which the all the LED's are arranged in the form of matrix.

LED dot matrix consists of 20 LED's arranged in 5 rows and 4 columns (5 x 4). In this matrix we can select any LED by corresponding row and column number.

The total block diagram describes that to display any type of alphanumeric characters based on row and column decoders. The row decoder can be programmed as per our design. The column decoder controlled by input combinations and both the decoders operated on input clock signal. The power required to each block is supplied by the DC power supply.

Circuit Diagram:



Operation:

Her we used LED dot matrix (5x4), in which LED's are arranged in 5 rows and 4 columns. To reduce number of connections e used common anode or common cathode to select particular LED. In common anode all the anodes are shorted and brought out in each row and all the cathodes are shorted and brought out in each column. To light up any one LED in matrix we have to select by row and column LED can be light when we apply positive voltage to anode or negative voltage to cathode. It should be at least 3v.

Our aim is to display an alphabet by selection particular row and column in dot matrix. To reduce complexity in connection we used persistence of vision concept, in which each row is continuously scanned with a frequency at which our eye can't perceive it and we can feel it as continuous display or stable. So to scan each row of dot matrix we require decoder. Decoder is a combinational device with m x n (i/p x o/p). From 'n' anyone of input is high based on i/p combination with 'm' bits. To produce different combinations using m'bits we used a counter whose output is incremented by applying clock as input. To reduce complexity we used 4017 IC, it is a Johnson counter with 10 decoded outputs. It replaces the blocks of counter and decoder. We can obtain clock in different ways, we used 555IC timer and operated in free running mode to produce the clock at a required frequency. The frequency of output wave is depends upon R, C components used clock generator circuit. We produced clock at a range of 50HZ to produce stable display. Finally by taking DC supply of 5v through 7805IC regulator the 555IC produces clock at a frequency range of 50 HZ, Which is applied to 4017 IC. It changes the output state continuously at applied rate, out of 10, 5 outputs are coupled to each row of dot matrix.