

# A NEW APPROACH FOR DISPLAYING ALL BENGALI CHARACTERS

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## ABSTRACT

Seven segments display for 0-9 numerals are used in all sorts of electronic equipments. In this study an 31 segments display system has been proposed for bangle characters, both Digits and alphabets. First a grid structure consisting of 31 segments has been discovered so that all the bangle digits can be characterized by this segments. As there can be at most 10 digits(0-9) to be displayed, 4 bit inputs are used to represent each digit. Then after analyzing which are segments to be activated to be activated for which digit, appropriate logic circuit have been derived in order to display each bangla digit

**Keywords:** 7-segment display,31-segment display, Bangla digits, Bangla Alphabets

## 1. GENERAL INFORMATION

There is a 7-segment display for English digits. All the English digits(0-9) Can be displayed using the 7-segment display. On the other hand, all the Bangla digits(0-9) and alphabets can be represented using some or all the 31-segments which are non overlapping. The structure of this non-overlapping seg-ments is shown in Figure 1.1

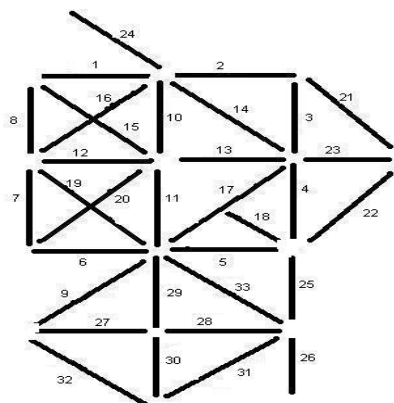


Figure 1.1: Model of 31-segment for Bengali display system

We need 31-segment display driver for Bengali display. Truth table for 5-input(A0,A1 ,A2,A3,A4) and 31-output (1-31) is derived for designing the actual circuit. The following table shows the circuit output of our 31-segment display.

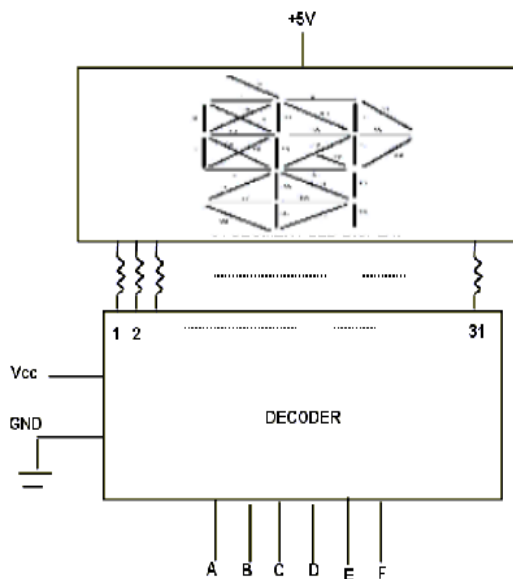


Figure 1.2: Block Diagram.

## 2. K-MAP SOLUTION FOR MINIMIZING THE EXPRESSIONS

According the previously developed theory, we have found the following minimized expressions for each LED segments.

		DEF							
AB	C	00	00	01	01	11	11	10	10
		0	1	1	0	0	1	1	0

00 0	0 1	1 1	3	2	6	7	5	4	<b>7 = FEA'D + ABC'D + E'BCD + D'E'F + DAFAB + F'EAD</b>
00 1	8 1	9 1	11	10	14	15	13	12	<b>8 = A'BCD + EFAC'</b>
01 1	24	25	27	26	30 1	31	29 1	28	<b>9 = BCDA + CDFE' + B'E'F' + ABCDE</b>
01 0	16	17	19	18	22	23 1	21 1	20	<b>10 = F'CDA + BD'FA' + ACB'FE</b>
11 0	48	49	51	50 1	54	55 1	53	52	<b>11 = E' B'CD + A'BCD + D'E'F' + DFEA</b>
11 1	56	57	59	58	62	63	61	60	<b>12 = A'CDE + BCD'A + B'E'F' + ABCDE</b>
10 1	40	41	43	42 1	46 1	47 1	45	44	<b>13 = FDA' + F'EAD + EFA</b>
10 0	32 1	33	35	34	38	39	37	36 1	<b>14 = FABC' + ABCDE'</b>

Table 1 : K-Map for Segment = 1

$$1 = A' B'D'F + BC'D'EF' + A'BDE' + AB'CEF' + AB'CDE + AB'CDE' + A'BDE'F'$$

Similarly,

$$2 = B'CDE + BCD'A + B'E'F' + ABCDE + DEFA' + AB'CDE + AB'CDE'$$

$$3 = BFDA' + F'EAD + EFAB' + B'E'F' + ABCDE + DEFA'$$

$$4 = EABC'A + E'BCD + D'E'F + DAFAB$$

$$5 = A' B'CD + F'EAD + EFA D' + B'E'F' + ABCDE + DEFA'$$

$$6 = F' B'CD + E'BCD + D'E'F + DAFAB + F'EAD + EFA D' + B'E'F' + ABCDE$$

$$26 = A' B'CD + F'EAD + EF A$$

$$27 = A' B'CD + E'BCD + D'E'F' + FAB$$

$$28 = ACA'D + ABC'D$$

$$29 = A'BCD + EFA'D'C'$$

$$30 = A'BCD + EBCD + B'E'F' + ABCDE$$

$$31 = CDAB' + A'B'D'C'$$

### 3. LIMITATIONS AND FUTUTRE WORK

Our future plan with this segmentation system is to make it with bending and curvature, so that it looks more accurate and significant similarity with Bangali Characters.

## 2 CONCLUSIONS

There exits a standard 7-segment display system for English digits. Also, 11-segment display for Bangla digits. We propose 31-segment display for all

Bengali Characters. Simulation program for this segmentation was coded in C/C++ and circuit were designed using circuit maker software [3][4][5]. In this paper, we have shown how to activate different segments to have a successful display of all the Bangla digits (০-৯) and Alphabets and Juktakhar through our proposed 31-segment display system. From now on the proposed design may be frequently used to represent Bengali digits which is more efficient than dot matrices display.

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