H. D. Jain College, Ara
Department of Physics
Dr. Annu Kumari
Guest Assistant Professor

input of only.

ENCODER :-

It performs a reverse decoder fun^{n}. An encoder accepts a digit on its inputs, such as a decimal digit and converts it to a coded output, such as binary or BCD.

We shall describe the decimal to BCD encoder. From table for BCD code, we note that:

(i) Most Significant Bit (MSB) of BCD code is D and it is a 1 for decimal digits 8 or 9. The expression for bit D in terms of decimal digits can therefore be written as

$$D = 8 + 9 \quad \text{---(1)}$$

(ii) Bit C of BCD code is a 1 for decimal digits 4, 5, 6, 7 so that

$$C = 4 + 5 + 6 + 7 \quad \text{---(2)}$$

(iii) Bit B is a 1 for decimal digits 2, 3, 6 or 7 so that

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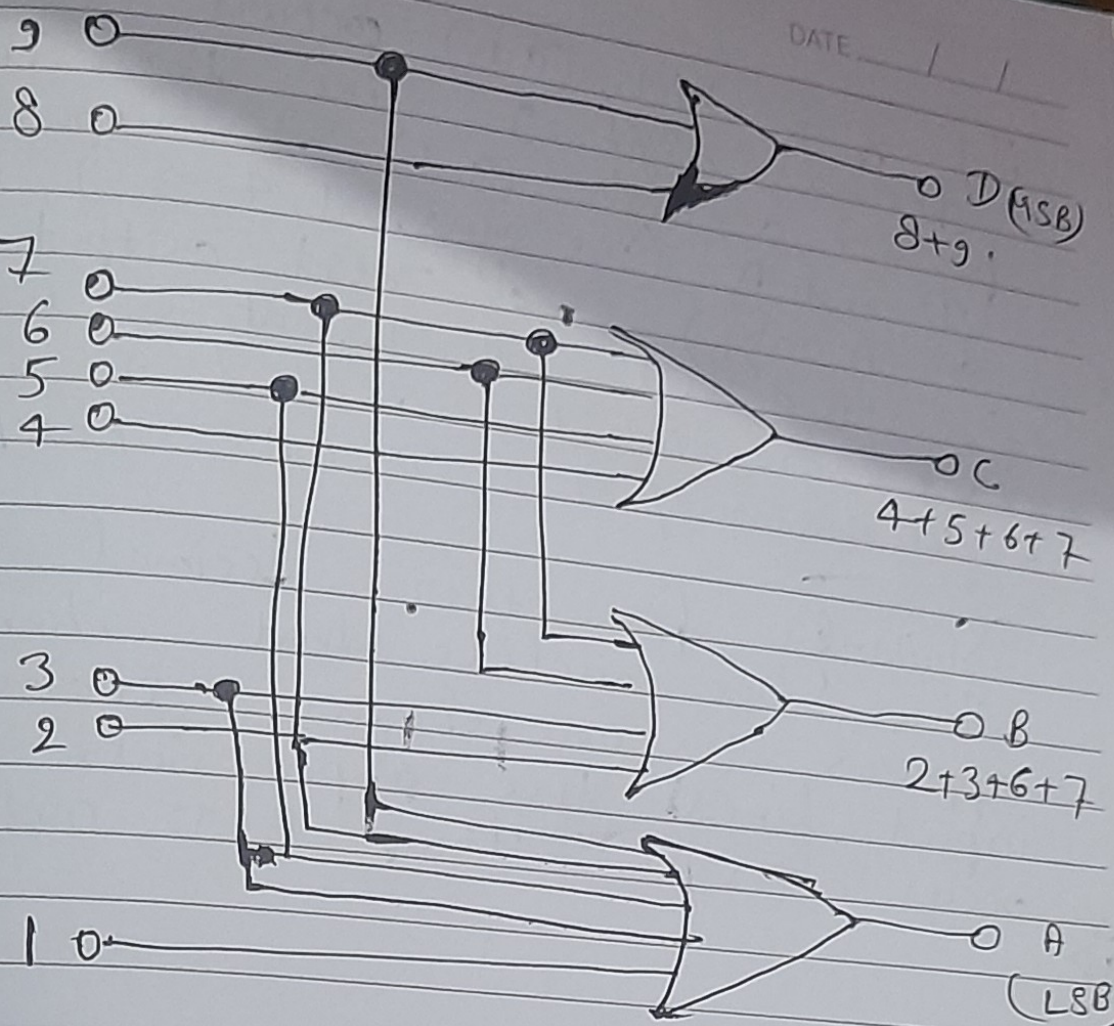
$$B = 2+3+6+7 \quad \text{---} (3)$$

(iv) Bit A is a 1 for decimal digits 1, 3, 5, 7 or 9. The expression for A is

$$A = 1+3+5+7+9$$

Decimal digit	BCD code			
	D	C	B	A
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

fig (1) Basic logic for a decimal to BCD encoder



Basic logic for a decimal to BCD encoder is shown in fig 1. From logic we note that:

(i) if a high (a 1) occurs at input decimal digit 7 line then it will produce a high (a 1) at output lines C, B and A (see equation 2, 3, 4 as 7 occur in C, B, A) and a low (a 0) at D so that for input decimal digit 7 we get an output DCBA = 0111, the BCD code for decimal digit 7.

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(ii) if a high (a 1) occurs at input decimal digit 9 line then it will produce a high (a 1) at output lines D and A (see eqns. 1, 4 as 9 occurs in D and A only) and rest output lines (i.e. B and C) will be at a low (a 0) so that for input decimal 9 we shall get an output DCBA = 1001.

Similarly for other decimal digits. Thus we conclude that when a high appears on one of the decimal digit input lines the appropriate levels occur on the four BCD output lines.

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