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Degree * B.S (software Engr)

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Paper * DLD

QUESTION - NO - 1

PART 'A'

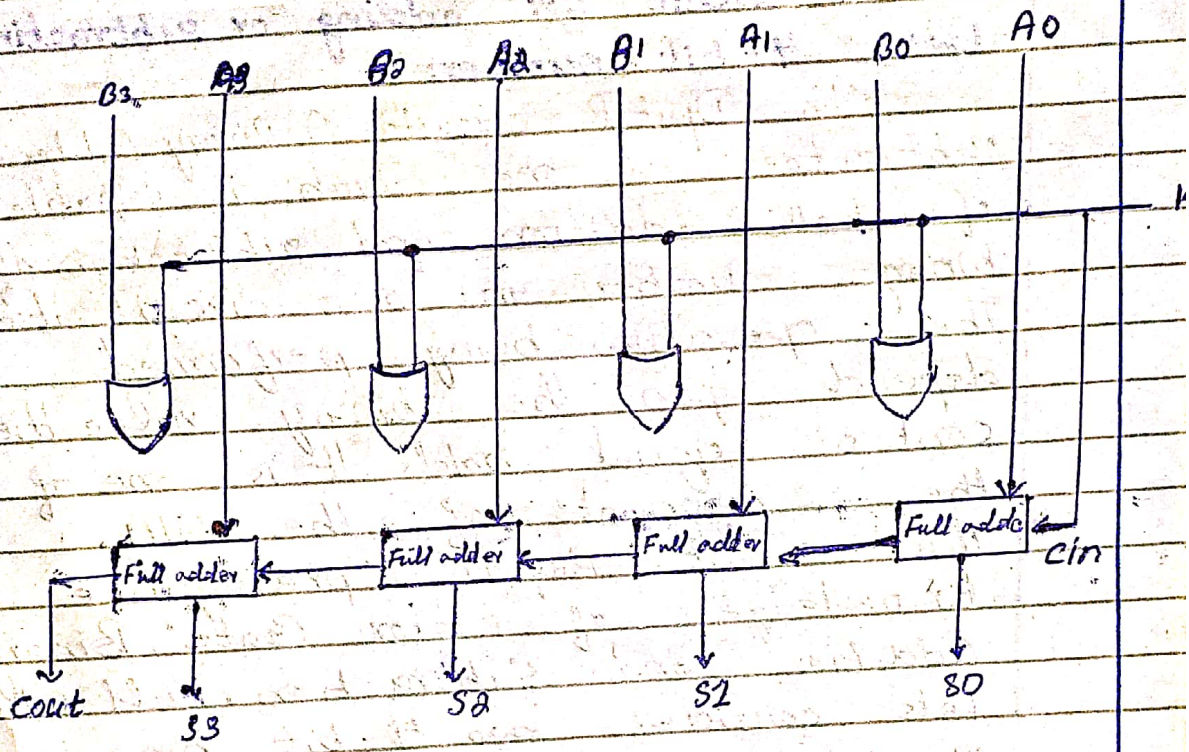
A circuit for adding or subtracting two 4-bit numbers.

In Digital circuits. A Binary Adder-subtractor is one which is capable of both addition and subtraction of binary number in one circuit itself The operation being performed depends upon the binary value the control signal holds. It is one of the components of the ALU. This circuit Requires prerequisite knowledge of Exor Gate, Binary Addition and Subtraction, Full Adder lets consider two 4-bit binary number A and B as inputs to the Digital Circuit for the operation with digits.

A0 A1 A2 A3 for A

B0 B1 B2 B3 for B

The circuit consists of 4 full adders since we are performing operation on 4-bit numbers. There is a control line K that holds a binary value of either 0 or 1 which determines that the operation being carried out is addition or subtraction.



PART 'B':-

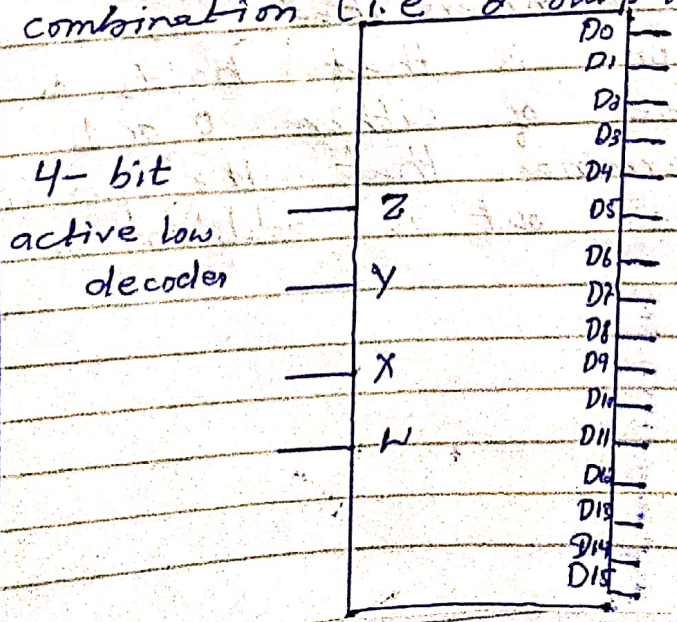
4-bit active low decordes:

A decorder is a building block that.

→ Takes in an n-bit binary number as input

→ Decodes that binary number and activites the corresponding output.

→ Individual output for Every input combination (i.e 2^n outputs)



1 output for each combination of the input number.

PART 'C':-

Decimal to BCD encoder:

A decimal to BCD encoder is known as 10-line to 4-line encoder It accepts 10-inputs and produces as 4-bit output corresponding to the activated decimal input. Figure 01 shows the logic symbol of decimal to BCD encoder.

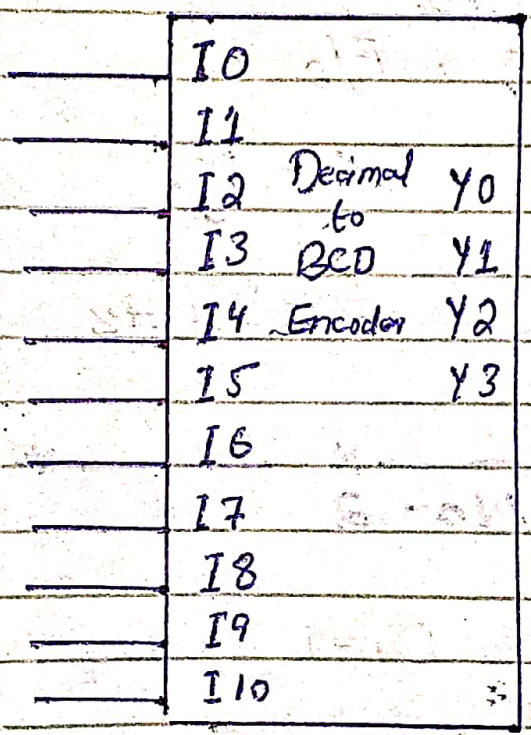
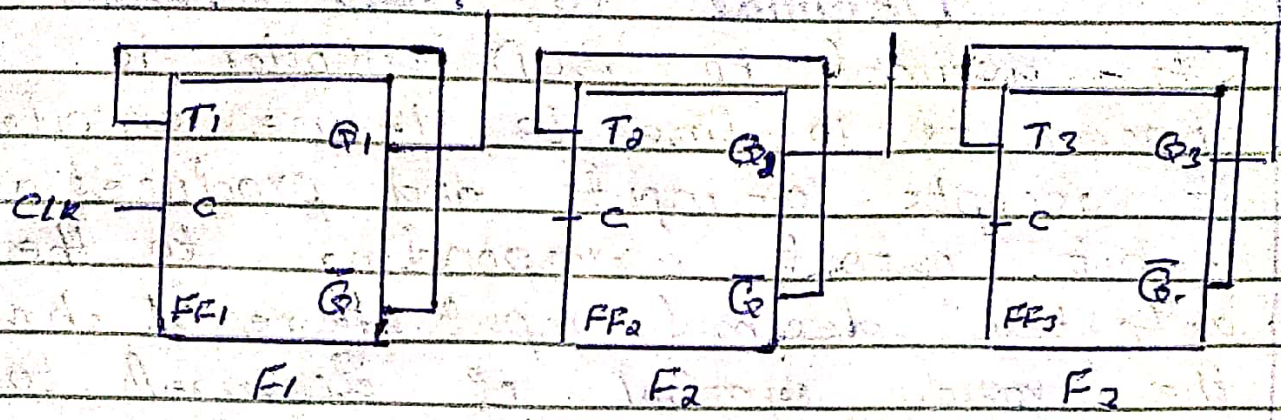


Figure - 01

{ Decimal to Binary Encoder }

D: Frequency divider :-



Here we assume the frequency is 16 kHz

So, F/2

$$F = \frac{16}{2}$$

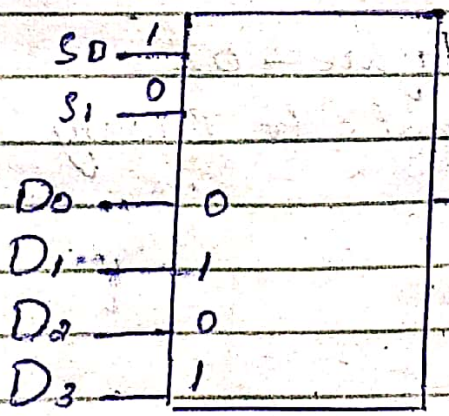
$$F = 8 \text{ kHz}$$

QUESTION- NO- 2

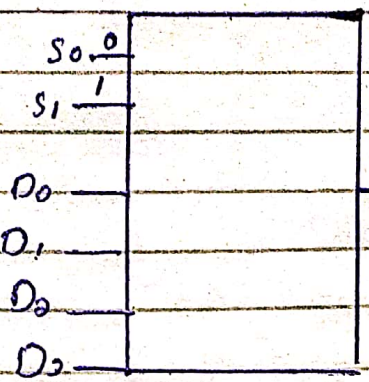
ANSWER:-

$D_0 = 0$, $D_1 = 1$, $D_2 = 0$, $D_3 = 1$

(a)

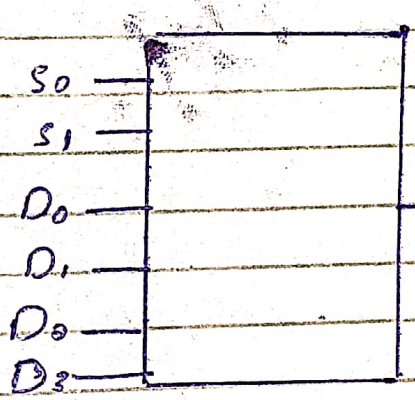


(b) :- $S_0 = 1$, $S_1 = 1$



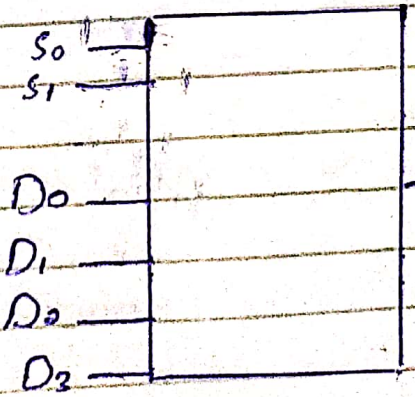
$S_0 \cdot S_1 = D_1$
$0 \cdot 1$

(c) :- $S_0 = 1$, $S_1 = 1$



$S_0 \cdot S_1 = D_2$
$1 \quad 0$

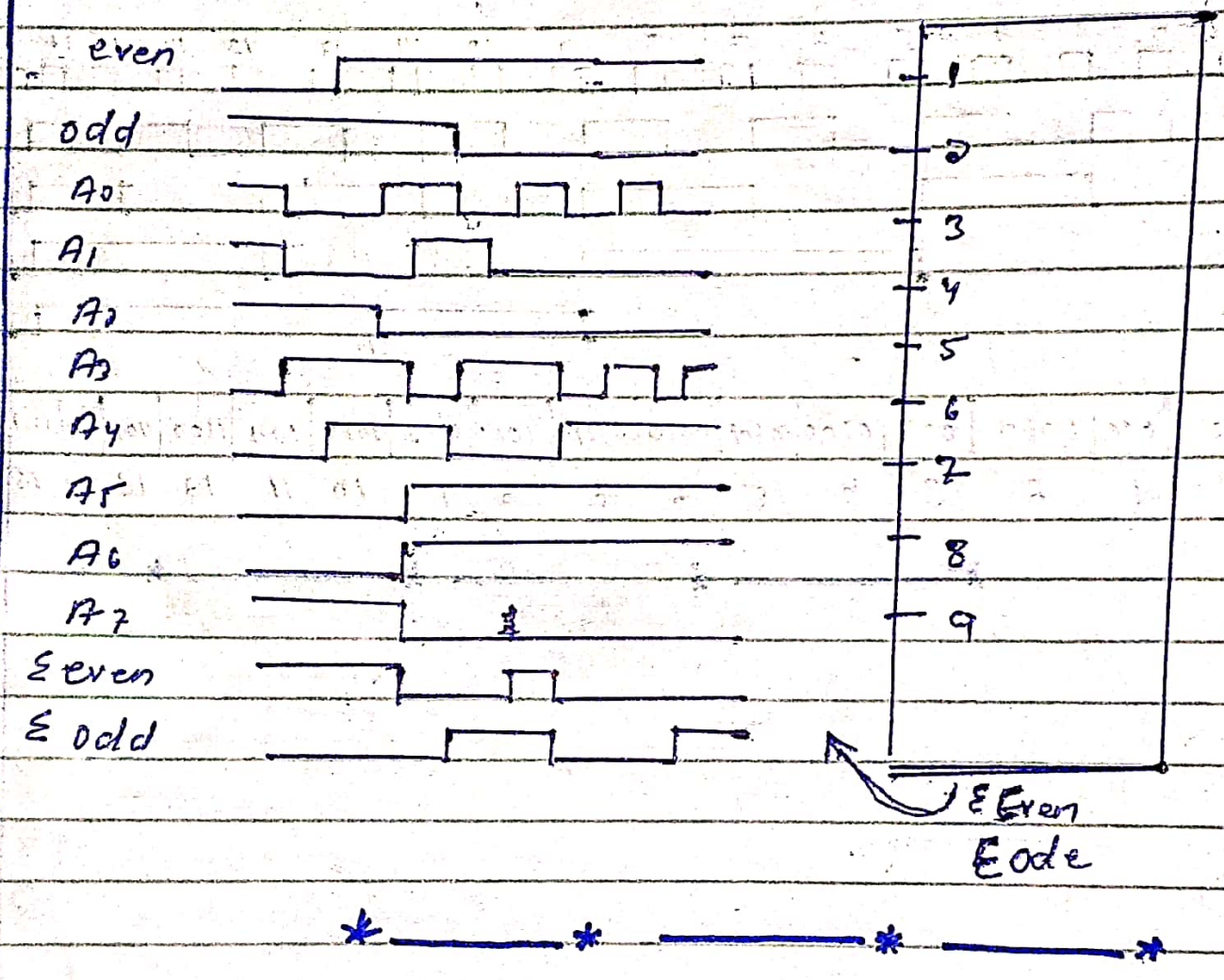
(D) :- $S_0 = 0$, $S_1 = 0$



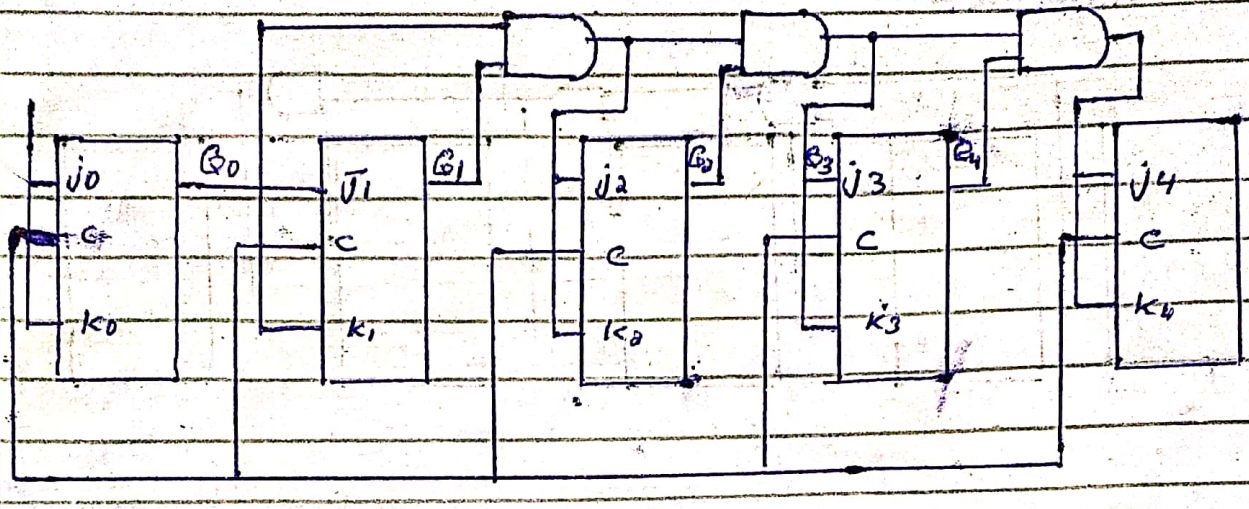
$S_0 \cdot S_1 = D_3$
$1 \quad 1$

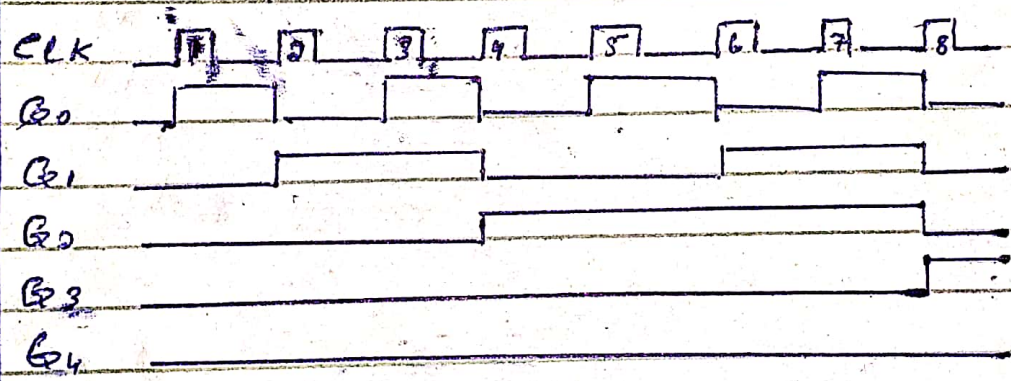
QUESTION - NO - 3

ANSWER:-



QUESTION-5





QUESTION-NO-6

ANSWER: