VIVEKANANDA COLLEGE
THAKURPUKUR
KOLKATA-700063

NAAC ACCREDITED 'A' GRADE

Topic: BCD CODE

Course Title: linear and digital electronics circuit

Paper: ELT-G-CC-2-2-TH

Unit: number system

Semester: 1st semester

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Name of the Department: Electronic Science

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Weighted Binary Codes :-

Weighted Binary codes are those binary codes which obey the positional weight principle. Each position of the number represents a specific weight.

BCD or 8421 Code :-

BCD or 8421 code is weighted binary code.

In BCD numbering system, a decimal number is separated into four bits for each decimal digit within the number. Each decimal digit is represented by its weighted binary value performing a direct translation of the number. The weights used in binary coded decimal code are 8, 4, 2, 1. Commonly called the 8421 codes, as it forms the 4 bit binary representation of the relevant decimal digit.

Binary power →	2^3	2^2	2^1	2^0
Binary weight →	8	4	2	1

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Truth table For BCD

Decimal number	BCD 8421 Code
0	0000
1	0001
2	0010
3	0011
4	0100
5	0101
6	0110
7	0111
8	1000
9	1001

after 9, BCD representations are different

examples:		
	10 (1+0)	0001 0000
	11 (1+1)	0001 0001
	22	0010 0010

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BCD addition :-

The rule for addition of two BCD numbers ⟶

i) Add the two numbers using the rules for binary addition.

ii) If a four bit sum is equal to or less than 9, it is valid BCD number.

iii) If a four-bit sum is greater than 9, or if a carry out of the group is generated, it is invalid result.
Then Add 6 (0110) to the four-bit sum to skip the six invalid states and return the code to BCD.

① add BCD 0101 and 0110

```
  0 1 0 1
  0 1 1 0
  ---------
  1 0 1 1   ⟶ invalid BCD.
+ 0 1 1 0   ⟶ Add 6
  ---------
0 0 0 1 0   ⟶ valid BCD.
```


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ii) add 19 and 14 in BCD form

19 in BCD → 0001 1001
14 in BCD → 0001 0100

0001 1001
0001 0101

ii) Add 19 and 14 in BCD form

19 in BCD → 0001 1001
14 in BCD → 0001 0100

0001 1001
0001 0100

0010 1101 → Right is invalid

not add 6 to the left group or it is valid

+ 0110

0011 0011

3 3.

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