

**Paper 7, TDC Part-3**  
**Chapter– 4, Combinational Logic Design**  
**Lecture - 17**

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# Combinational Logic Design

K-Map for  $E$

AB \ CD	00	01	11	10
00	1			1
01				1
11	x			x
10	1		x	x

$\bar{B}\bar{D}$  (circled group) and  $C\bar{D}$  (circled group)

$$E = \bar{B}\bar{D} + C\bar{D}$$

K-Map for  $F$

AB \ CD	00	01	11	10
00	1			
01	1	1		1
11	x	x	x	x
10	1	1	x	x

$\bar{C}\bar{D}$  (circled group),  $B\bar{D}$  (circled group),  $B\bar{C}$  (circled group), and  $A$  (circled group)

$$F = A + \bar{C}\bar{D} + B\bar{D} + B\bar{C}$$

# Combinational Logic Design

K-Map for  $g$

AB \ CD	00	01	11	10
00			1	1
01	1	1		1
11	x	x	x	x
10	1	1	x	x

$\bar{B}C$  (pointing to the top row)

$C\bar{D}$  (pointing to the right column)

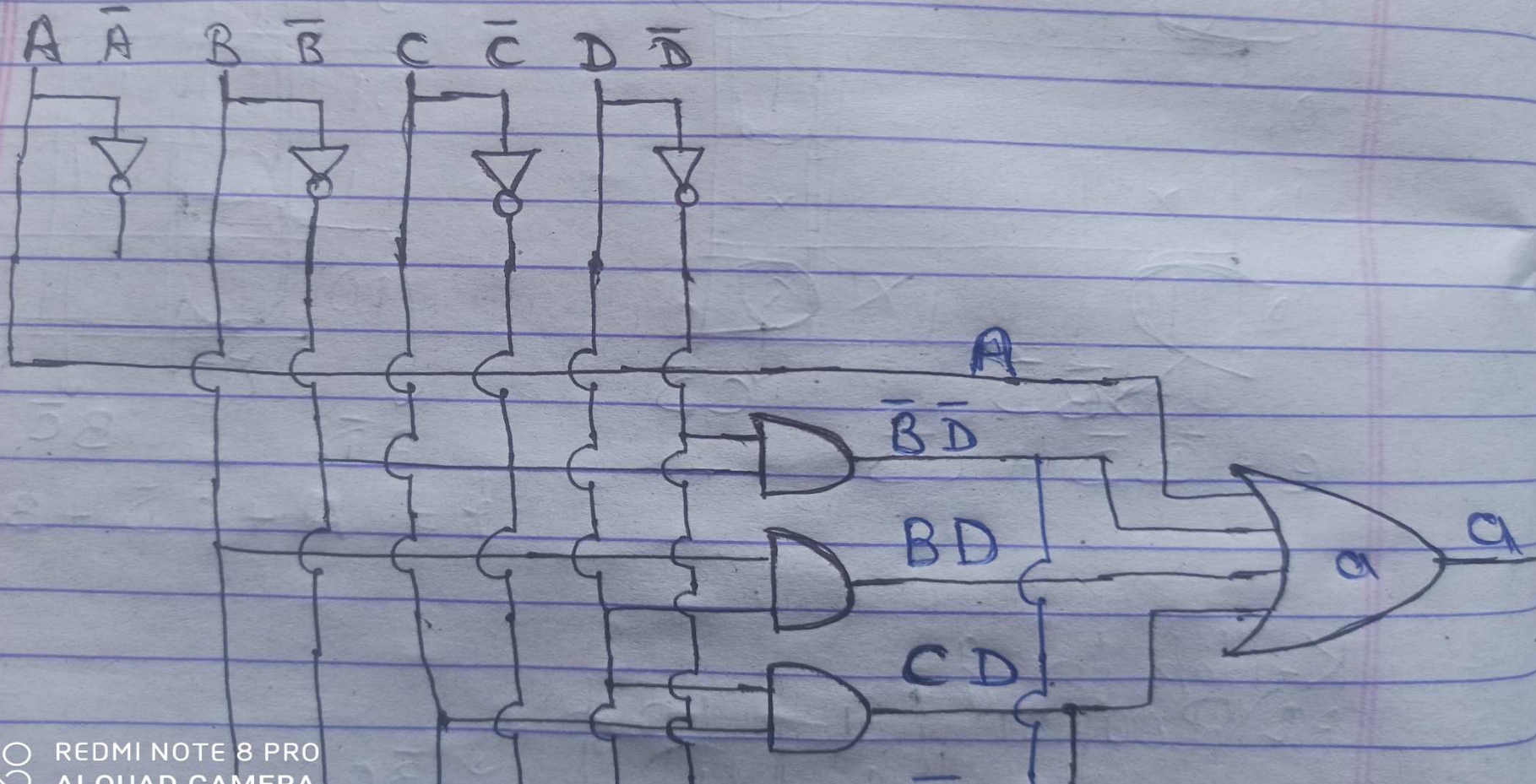
$B\bar{C}$  (pointing to the left column)

$g = A + \bar{B}C + C\bar{D} + B\bar{C}$

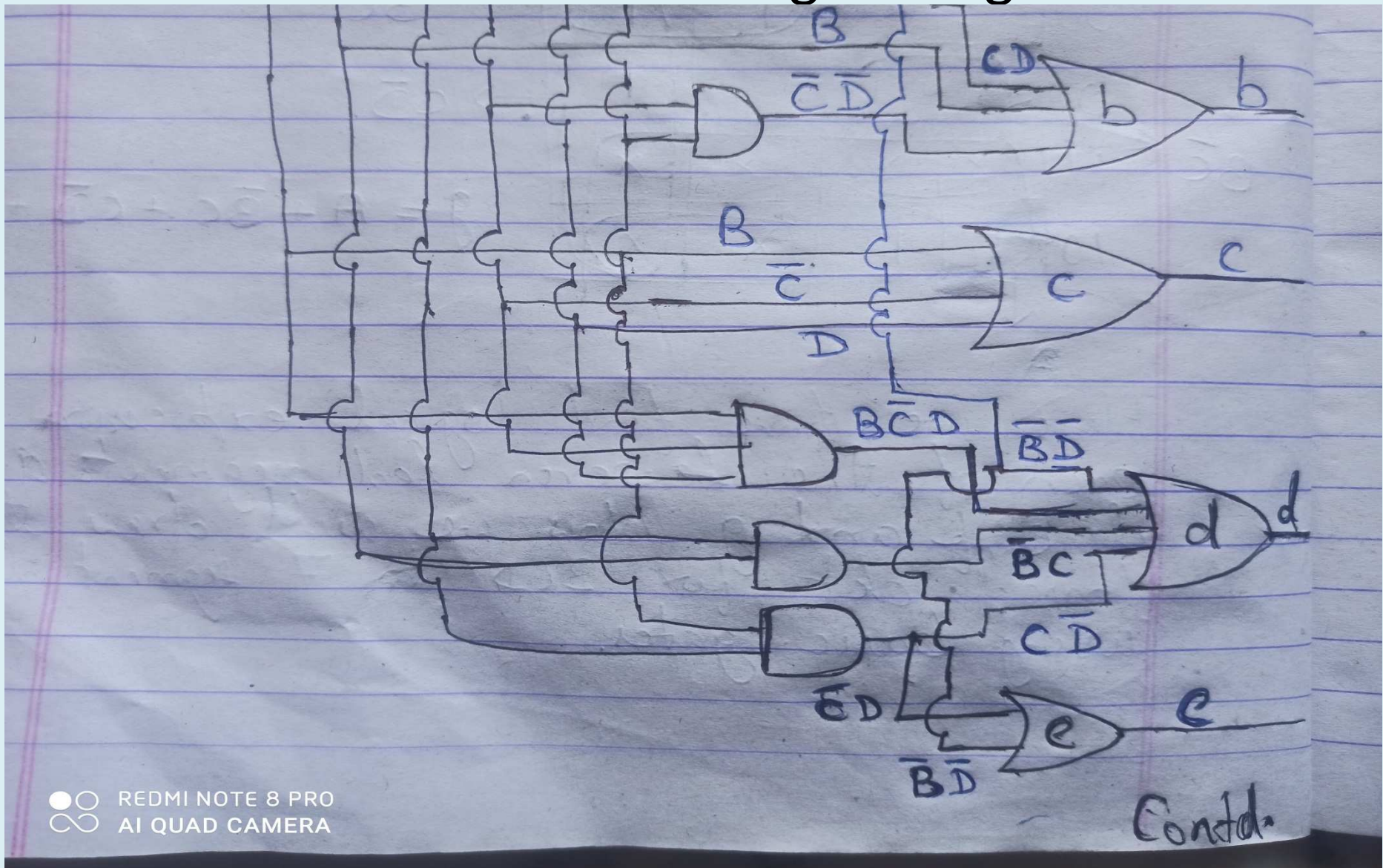
Here we have find logical expression for each of the seven led segments a, b, c, d, e, f and g. Now we will draw the logical ckt for BCD to 7-segment decoder using basic gates.

# Combinational Logic Design

Logical Ckt Diagram using basic gates for BCD to 7-segment Decoder.

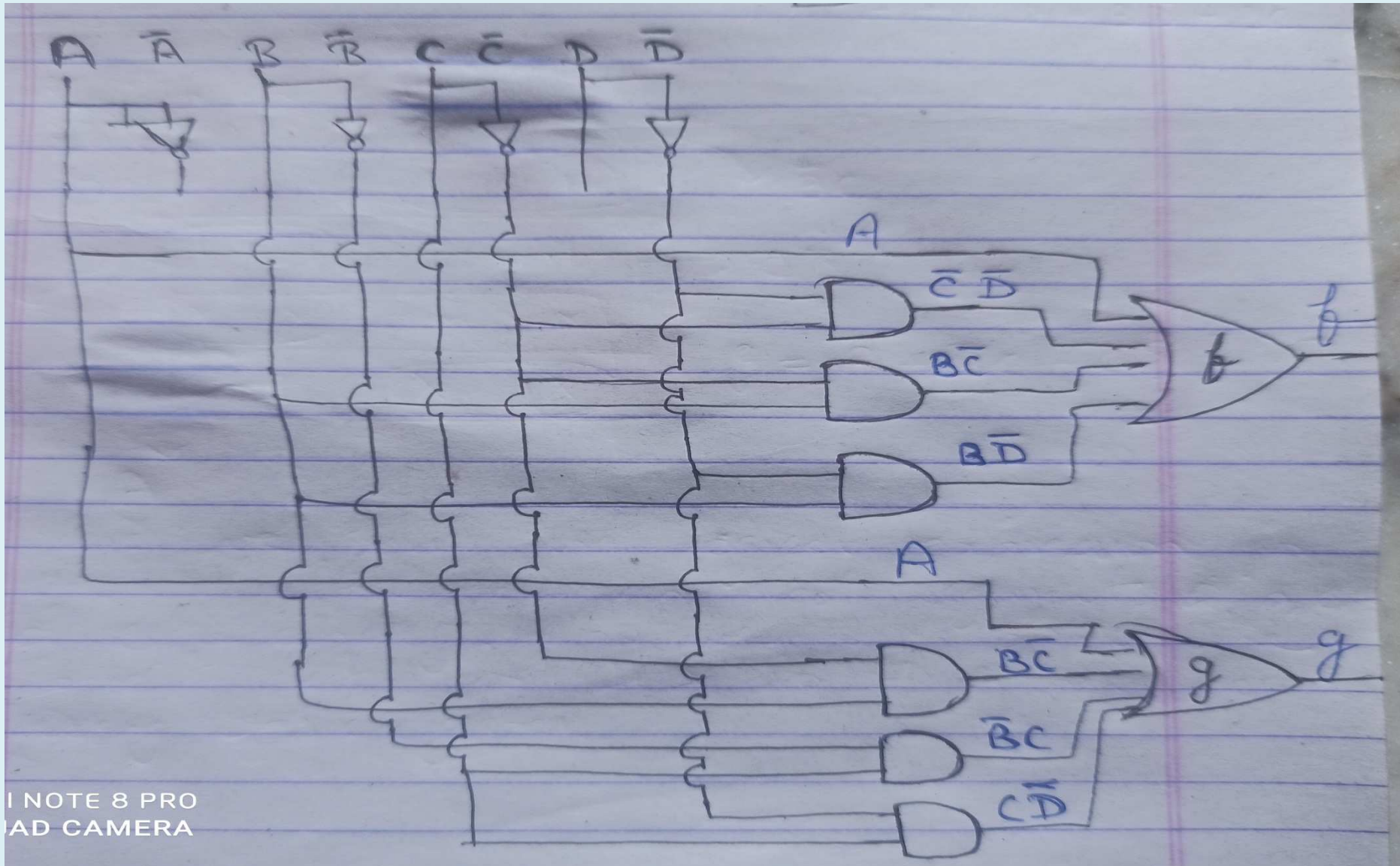


# Combinational Logic Design



Contd.

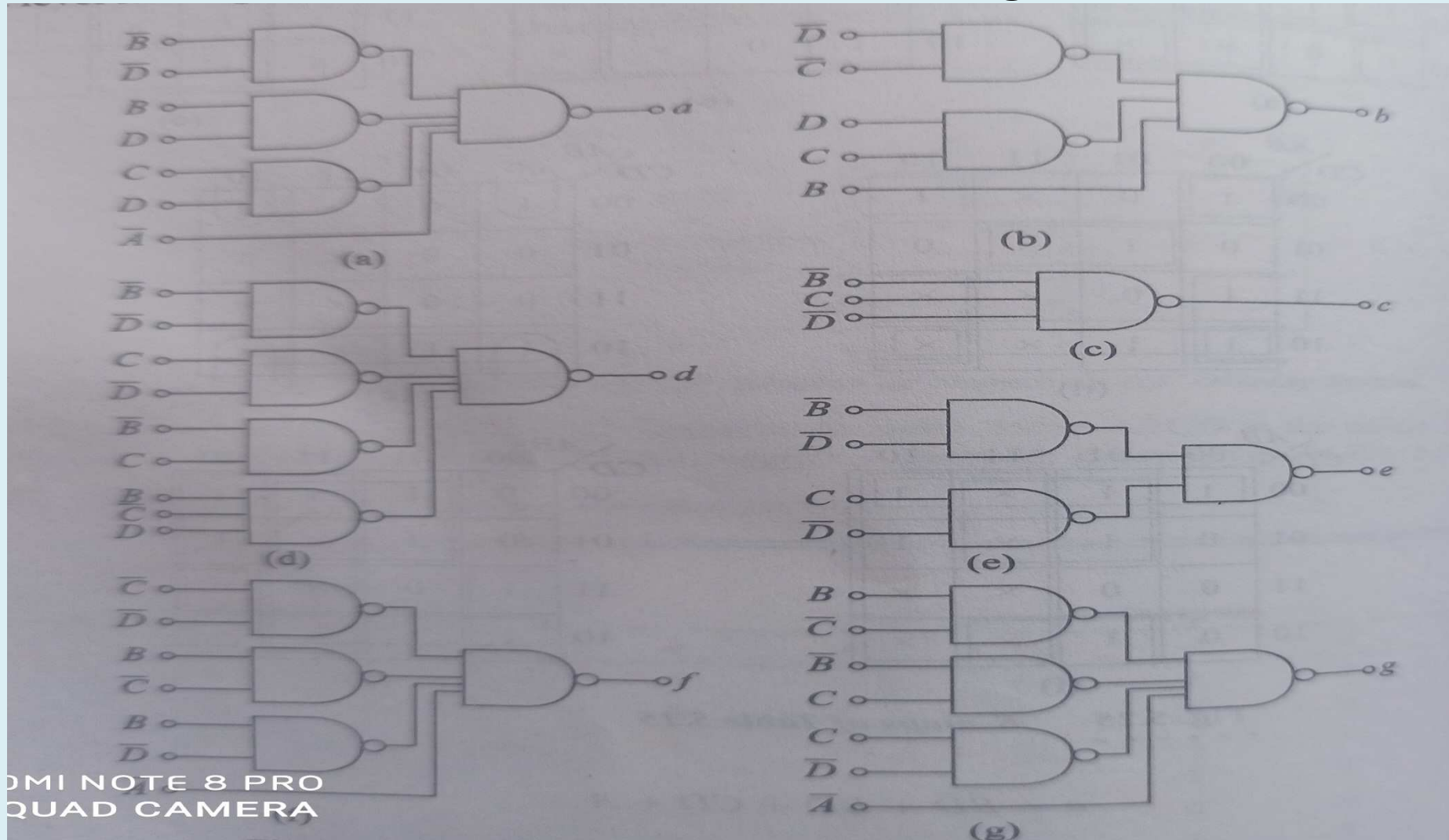
# Combinational Logic Design



I NOTE 8 PRO  
AD CAMERA

# Combinational Logic Design

- NAND-NAND Realization of BCD to 7 Segment Decoder



MI NOTE 8 PRO  
QUAD CAMERA

# Combinational Logic Design

Refer book- Modern Digital Electronics by RP Jain.

**Thank You**