

(1)

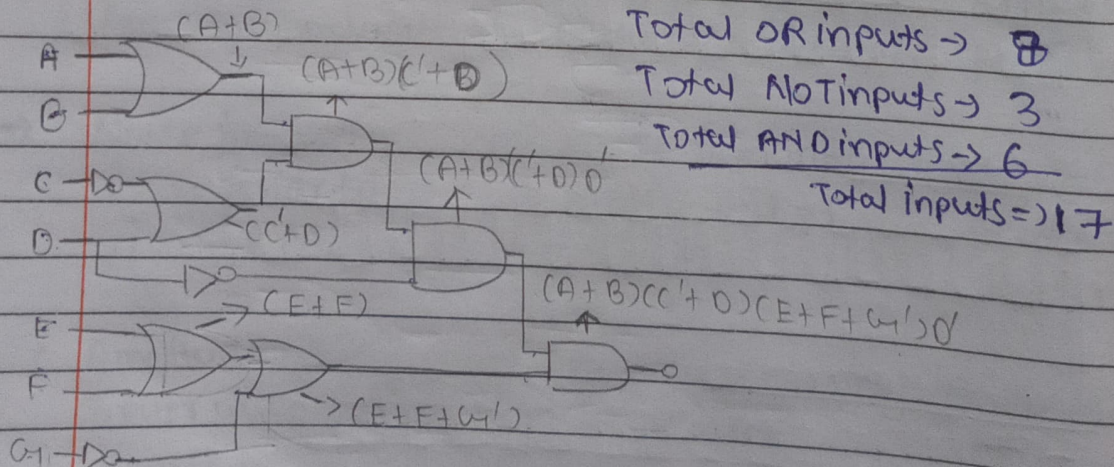
D.E AssignmentQ-1 Convert to minterms:-

$$\begin{aligned}
 (1) \quad A+B'C' &\Rightarrow ACB+B'C'+BCA+A'B'C' \\
 &\Rightarrow AB+AB'+AB'C'+A'B'C' \\
 &\Rightarrow ABC+C'+AB'(C+C')+A'B'C' \\
 &\Rightarrow ABC+ABC'+AB'C'+AB'C'+A'B'C' \\
 &\Rightarrow ABC+AB'C+AB'C'+AB'C'+A'B'C' \\
 &= A'B'C'+AB'C'+AB'C+AB'C'+ABC \\
 &= \sum m(0, 4, 5, 6, 7)
 \end{aligned}$$

$$\begin{aligned}
 (2) \quad A+B+CA &\Rightarrow A'(CB+B') + B(CA+A'B) + AC(B+B') \\
 &\Rightarrow A'B+A'B'+AB+A'B+ABC+AB'C \\
 &\Rightarrow AB+A'B+A'B'+ABC+AB'C \\
 &\Rightarrow ABC+C'+A'BCC+C'+A'B'CC+C'+ABC+AB'C \\
 &\Rightarrow ABC+ABC'+A'BC+A'BC'+A'B'C+A'B'C'+ABC+ABC \\
 &\Rightarrow A'B'C+A'B'C'+A'BC'+ABC'+AB'C+A'BC+ABC \\
 &= \sum m(0, 1, 2, 6, 5, 3, 7)
 \end{aligned}$$

Q-2 How many gate inputs require?

$$(1) \quad (A+B)C'(C'+D)CE+F+G' \cdot 0'$$





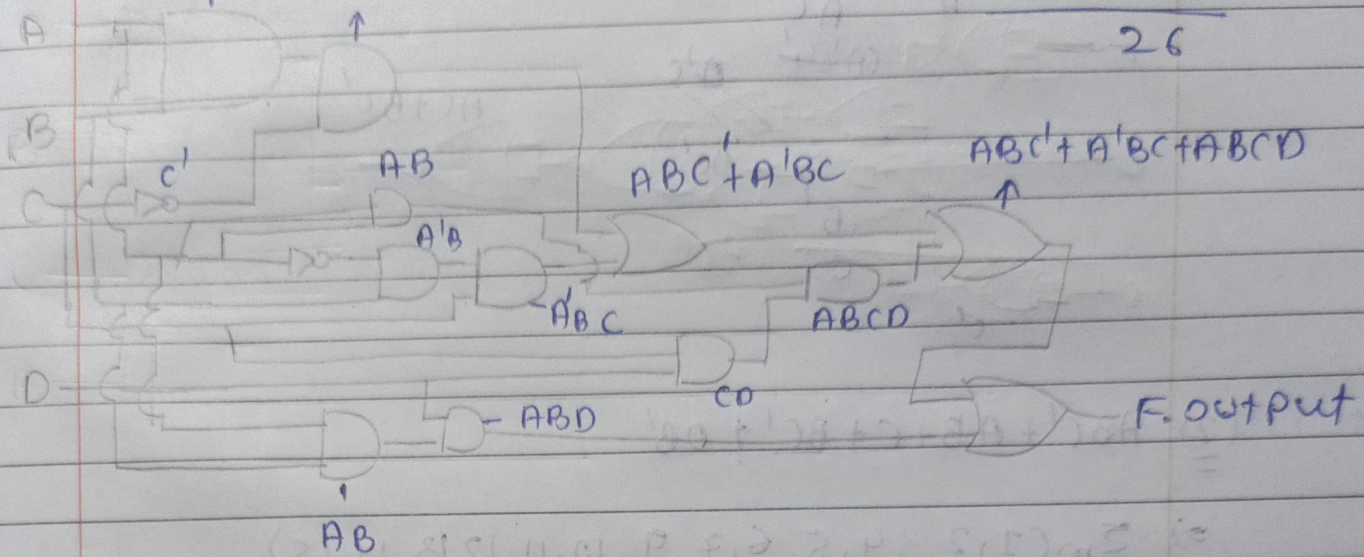
Q2)  $ABC' + A'BC + ABCD + ABD$

Total AND inputs = 18

Total OR inputs = 6

Total NOT inputs = 2

26



Q-3 Reduce using K-map & implement using NAND & OR gate

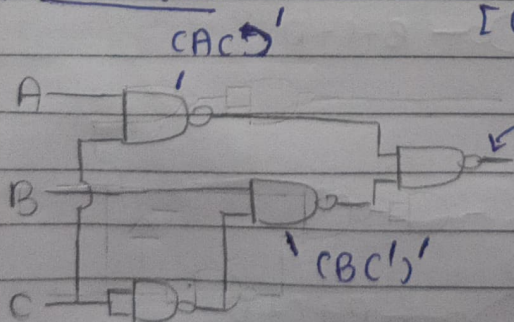
(1)  $AB + AB'C + A'BC' + BC'$   
 $= ABC + C' + AB'C + A'BC' + CA + A'BC'$   
 $= ABC + \underline{ABC'} + AB'C + \underline{A'BC'} + \underline{ABC'} + \underline{A'BC'}$   
 $= ABC + ABC' + AB'C + A'BC'$   
 $= \Sigma(2, 5, 6, 7)$

| AB \ C | 00 | 01 | 11 | 10 |
|--------|----|----|----|----|
| 0      |    | 1  | 1  | 1  |
| 1      |    | 1  | 1  | 1  |

→ Reduced form -

$$F = BC' + AC$$

$$= AC + BC'$$

\* NAND Gate:-

$$[(CAC') \cdot (BCB')] = AC + BC'$$

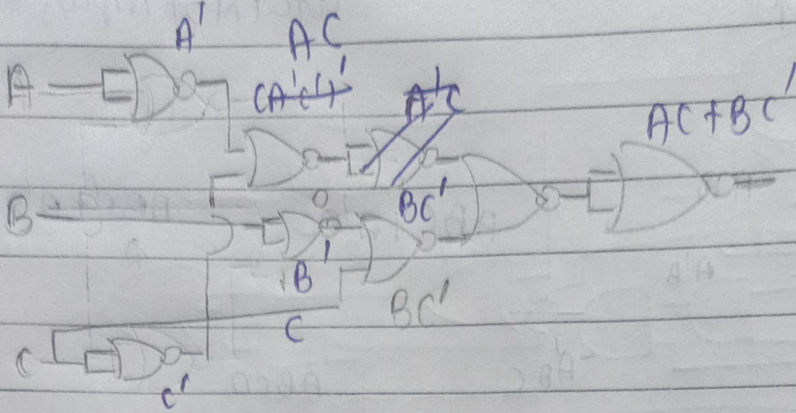
$$AC + BC'$$



③

$$\Rightarrow F = AC + BC'$$

\* NOA Gate:-



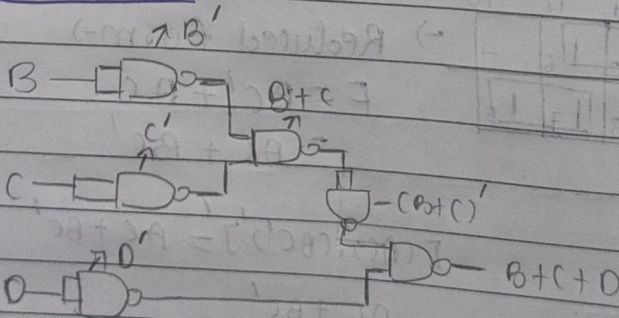
$$(2) \quad ABC' + AB + C + BC' + DB'$$

$$\Rightarrow \Sigma_m(1, 2, 3, 4, 5, 6, 7, 9, 10, 11, 12, 13, 14, 15)$$

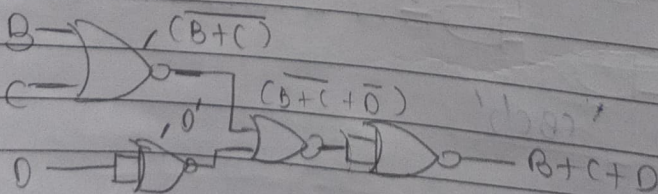
|    |    | CD |    |    |    |
|----|----|----|----|----|----|
|    |    | 00 | 01 | 11 | 10 |
| AB | 00 | 0  | 1  | 1  | 1  |
|    | 01 | 1  | 1  | 1  | 1  |
|    | 11 | 1  | 1  | 1  | 1  |
|    | 10 | 0  | 1  | 1  | 1  |

$$\Rightarrow B + C + D$$

\* NAND Gate:-



\* NOR Gate:-





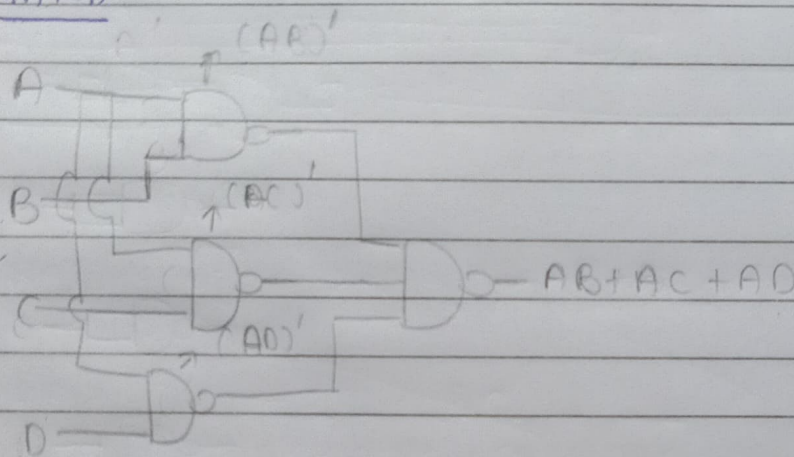
(3)  $\Sigma m(9, 10, 12) + d(3, 5, 6, 7, 11, 13, 14, 15)$

=)

| AB \ CD | 00 | 01 | 11 | 10 |
|---------|----|----|----|----|
| 00      |    |    | X  |    |
| 01      |    | X  | X  | X  |
| 11      | 1  | X  | X  | X  |
| 10      |    | 1  | X  | 1  |

$$F = AB + AC + AD$$

\* NAND



\* NOR

