**Department of Computer Science**

National University of Computer and Emerging Sciences

Lahore Campus

**Digital Logic Design**

**EE227**

**Section E & F**

**Assignment 2**

**Due Date 16th April 2021**

**Submit handwritten PDF document in Google Classroom.**

**No late submissions are allowed.**

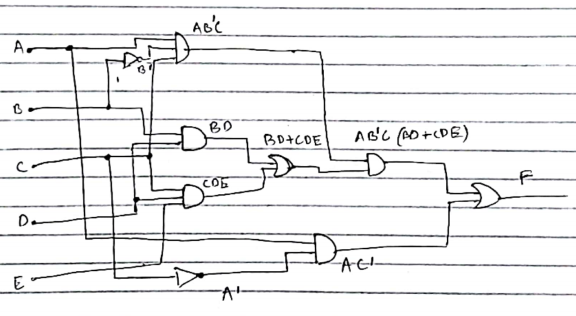
**Question 1**

Simplify following combinational circuits using Boolean algebra identities and rules.

1. AB’C(BD + CDE) + AC’
2. AB’C + A’BC + A’ B’C
3. BCDE + BC(DE)’ + (BC)’DE

Draw both circuits and calculate gate input cost before and after simplification.

**(a)**

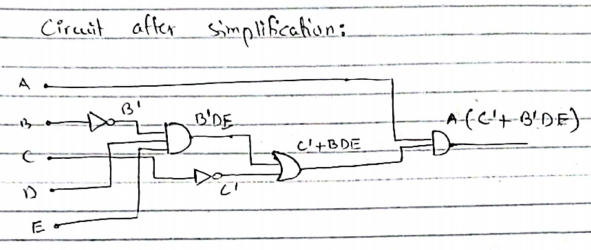
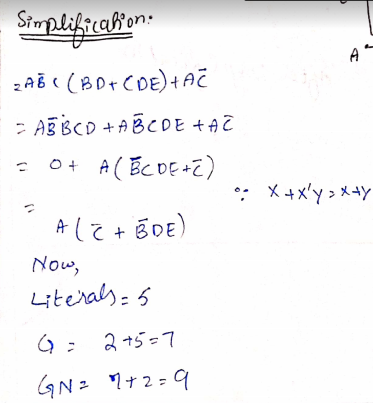


Gate input cost= G = (3 x 2) + (2 x 3) + (2 x 2)

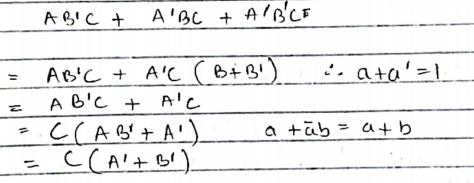
= 16

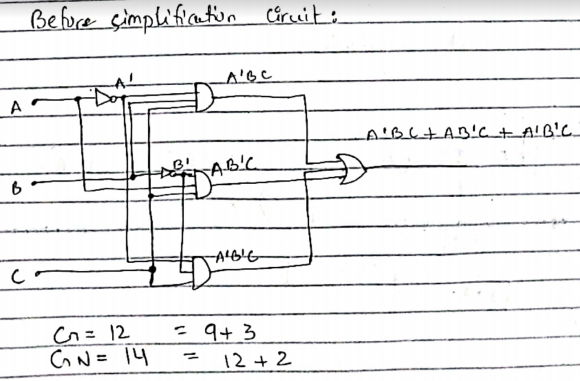
GN= 16 + 2

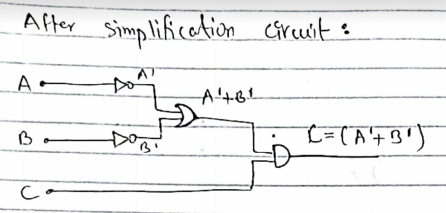
As there are 2 AND gates of 3 inputs, 3 AND gates of 2 inputs, 2 OR gates of 2 inputs and 2 NOT gates.



**(b)**







G= 4

GN= 4 + 2 = 6

**(c)**

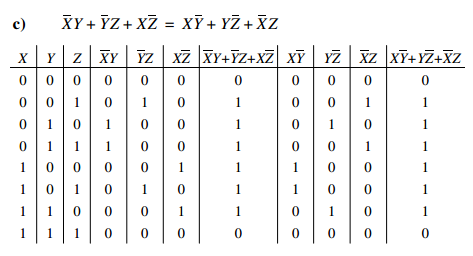
**Same procedure as above parts**

**Book Morris Mano 5th edition**

**2.1 (c)**



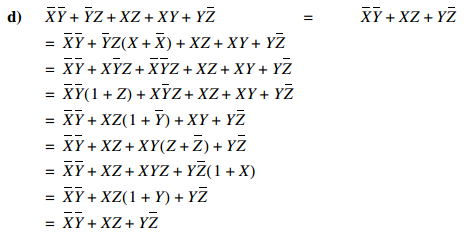




**2.2 (d)**



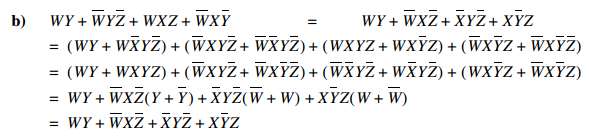




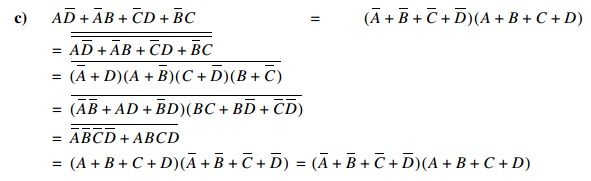
**2.3 (b)(c)**





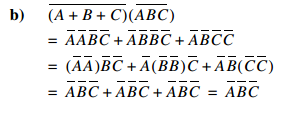




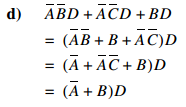


**2.6 (b)(d)**

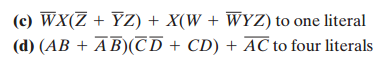
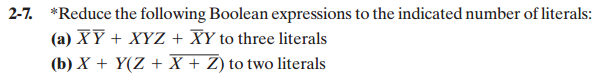


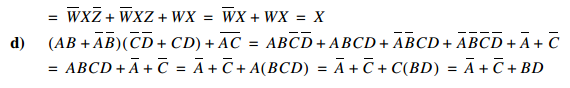
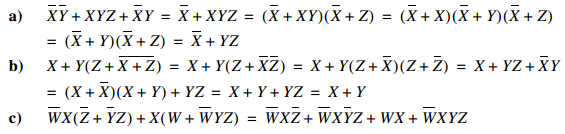




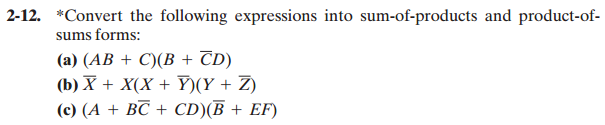


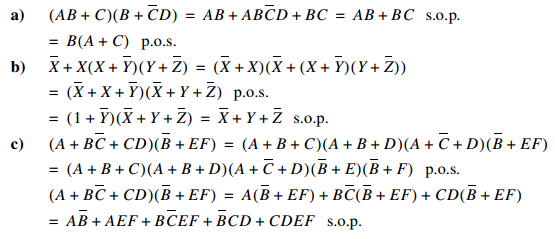
**2.7**





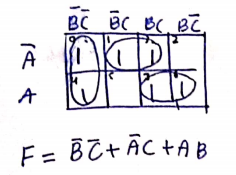
**2.12**





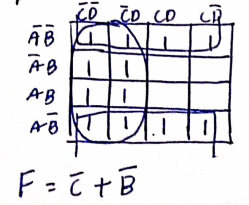
**2.14 (d)**



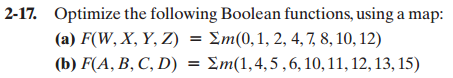


**2.15 (c)**

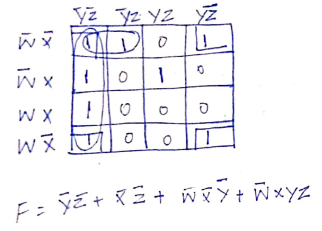




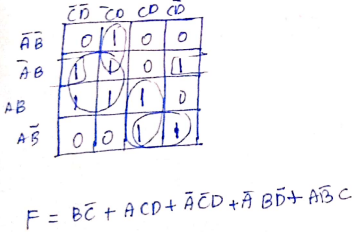
**2.17**



**(a)**



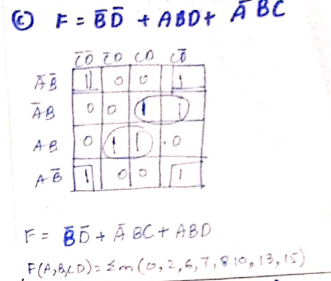
**(b)**



**2.18 (c)**





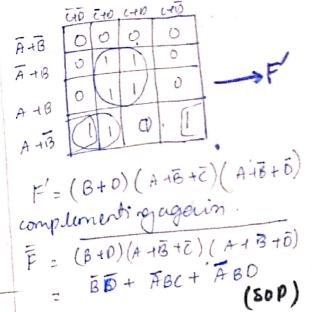


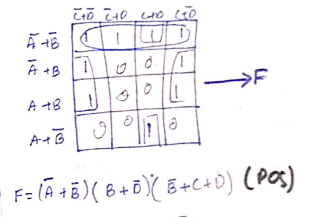
**2.22(c)**



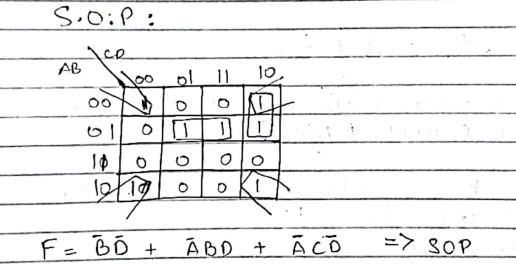
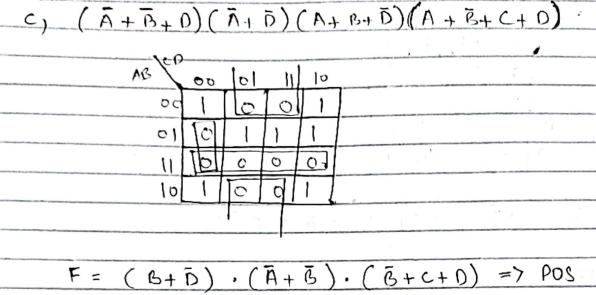


**Sol 1:**





**Sol 2:**

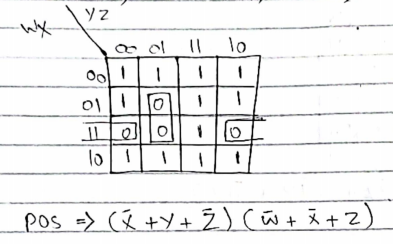


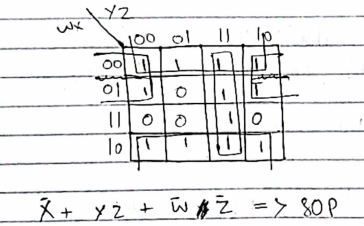


**2.23 (b)**







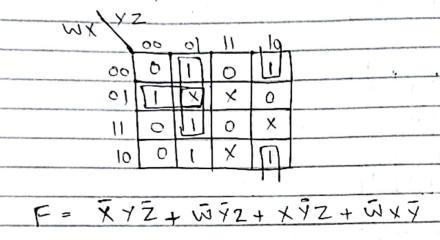




**2.24 (c)**



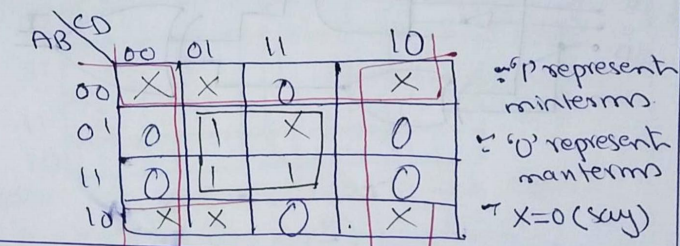


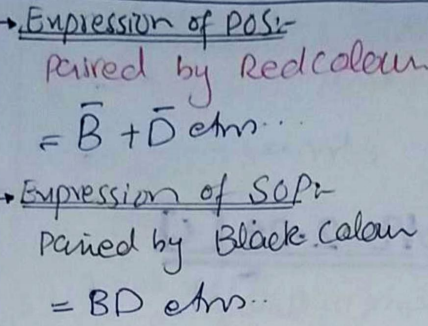


**2.26(b)**

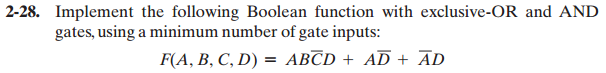








**2.28**



**A piece of paper with writing on it

Description automatically generated**