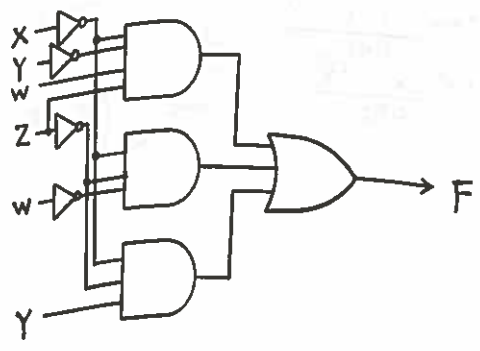
(c) $AB'C'(D+BC')+C'D+A'B'$
$\overset{P4b}{=}AB'C'D+\overset{P5b}{AB'BC'}+C'D+A'B'$
$\overset{T3a}{=}AB'C'D+C'D+A'B'$
$=C'D+A'B'$

(d) $F=((X'Y)'+XY'+Z(X+YZ)'+X'Z')'$
$F'=\overset{T5b}{(X'Y)'}+XY'+\overset{T5a\&b}{Z(X+YZ)'}+X'Z'$
$=X+\overset{T3a}{Y'+XY'}+\overset{P4b}{Z(X(Y'+Z'))}+X'Z'$
$=X+Y'+XY'Z+\overset{P5b}{XZZ'}+X'Z'$
$=X+\overset{T3a}{Y'+XY'Z}+X'Z'$
$=X+Y'+X'Z'$
$=Y'+\overset{T4a}{X+X'Z'}$
$=Y'+X+Z'=X+Y'+Z'$
$F=(F')'=(X+Y'+Z')'=X'YZ$

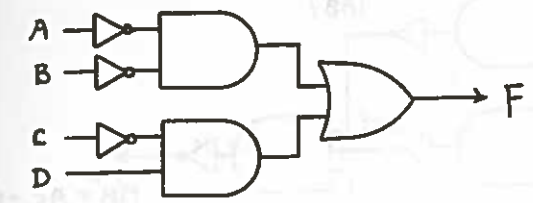
(e) $XY'Z+XY'Z'+\overset{T1a}{XZ'Y+YZ'X}+XZ'Y'$
$=\overset{P4b}{XY'Z+XY'Z'}+\overset{P4b}{XYZ'+XY'Z'}$
$=XY'(\overset{P5a}{Z+Z'})+XZ'(\overset{P5a}{Y+Y'})$
$=XY'+XZ'$

2.18 (a) $F=P'+Q$

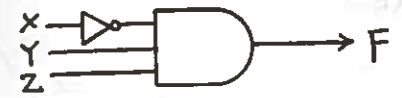
(b) $F=X'YZ'+W'X'Z'+WX'Y'Z$



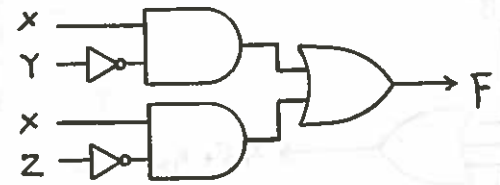
(c) $F=C'D+A'B'$



(d) $F=X'YZ$



(e) $F=XY'+XZ'$



2.19 (a) $P(A,B,C)=A'B'C'+A'B'C+A'BC+AB'C$
(b) $P(A,B,C)=A'B'C'+\overset{T1a}{A'B'C}+A'BC+AB'C$
$\overset{T1a}{=}A'B'C'+A'B'C+\overset{T1a}{A'B'C}+A'BC+AB'C$
$=A'B'C'+A'B'C+A'B'C+A'B'C+A'BC+AB'C$
$=(\overset{P4b}{A'B'C'+A'B'C})+(\overset{P4b}{A'B'C+A'BC})+(\overset{P4b}{A'B'C+AB'C})$
$=A'B'(\overset{P5a}{C'+C})+A'C(\overset{P5a}{B'+B})+B'C(\overset{P5a}{A'+A})$
$=A'B'+A'C+B'C$