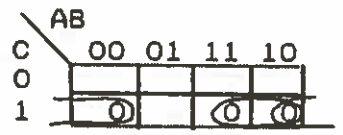
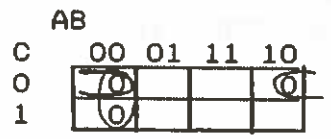
3.7 (a)F=$\sum$m(0,2,3,4,6)



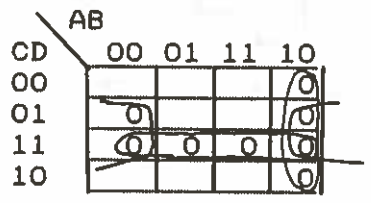
F=(A'+C')(B+C')

(b)F=$\prod$M(0,1,4)



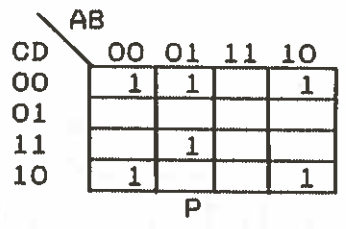
F=(A+B)(B+C)

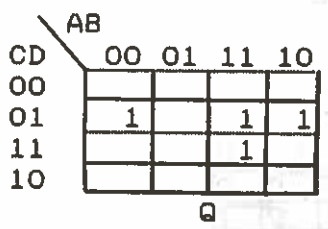
(c)F=BC'D'+BC'D+A'C'D'+BCD'+A'B'CD'

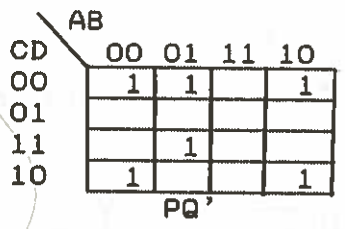


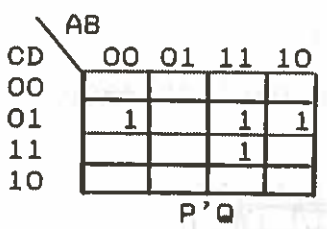
F=(A'+B)(C'+D')(B+D')

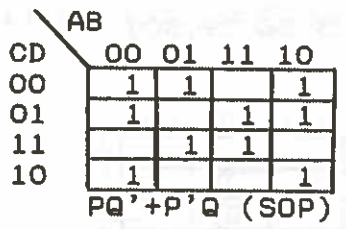
3.8 P(A,B,C,D)=$\sum$m(0,2,4,7,8,10), Q(A,B,C,D)=ABD + B'C'D
(a) Minimum SOP

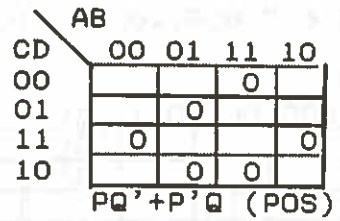








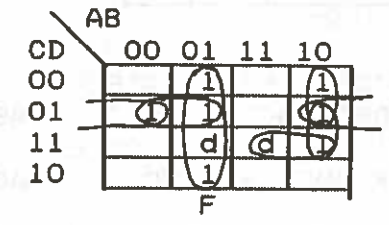


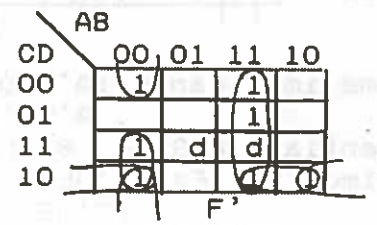


P ⊕ Q=B'D' + B'C' + BCD + A'C'D' + ABD

(b) Minimum POS
See K-maps in (a)
P ⊕ Q=(A'+B'+D)(B'+C'+D)(B+C'+D')(A+B'+C+D')

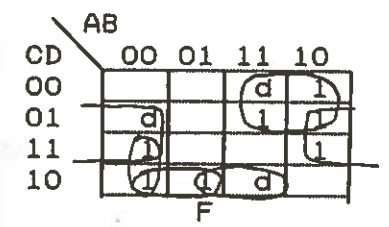
3.9 (i) F=$\sum$m(1,4,5,6,8,9,11) + d(7,15)

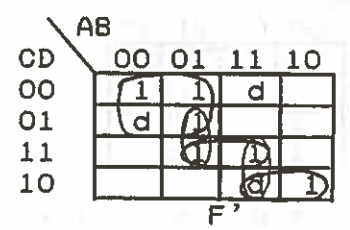




(a)Prime implicants :A'C'D, A'B, ACD, AB'C', AB'D, B'C'D
(b)Essential :A'B, AB'C'
(c)Minimum SOP F=A'B + AB'C' + A'C'D + ACD
(d)Minimum SOP F'=AB + A'B'D' + A'B'C + B'CD'
(e)Minimum POS F=(A'+B')(A+B+D)(A+B+C')(B+C'+D)
(f)Minimum POS F'=(A+B')(A'+B+C)(A+C+D')(A'+C'+D')

(ii)F=$\sum$m(2,3,6,8,9,11,13) + d(1,12,14)





(a)Prime implicants :AC', B'D, A'B'C, A'CD', BCD'
(b)Essential :AC', B'D
(c)Minimum SOP F=AC' + A'CD' + B'D
(d)Minimum SOP F'=A'C' + BCD + ACD'
(e)Minimum POS F=(A+C)(B'+C'+D')(A'+C'+D)
(f)Minimum POS F'=(A'+C)(A+C'+D)(B+D')