

K-map for CBSE 2019 6.D

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1 Question

Reduce the following Boolean expression to its simplest form using K-map:

$$F(P, Q, R, S) = \sum(0, 1, 2, 3, 5, 6, 7, 10, 14, 15) \quad (1)$$

2 Boolean equation - SOP form

$$F = \overline{P}Q + R\overline{S} + \overline{P}S + QR \quad (2)$$

3 K-Map

		<i>RS</i>			
		00	01	11	10
<i>PQ</i>	00	1	1	1	1
	01	0	1	1	1
	11	0	0	1	1
	10	0	0	0	1

Figure 1: K-map for eq.(2)

4 Boolean Equation - POS form

We can derive the following POS from the above K-map

$$F = (\overline{P} + R)(\overline{Q} + R + S)(\overline{P} + Q + \overline{S}) \quad (3)$$