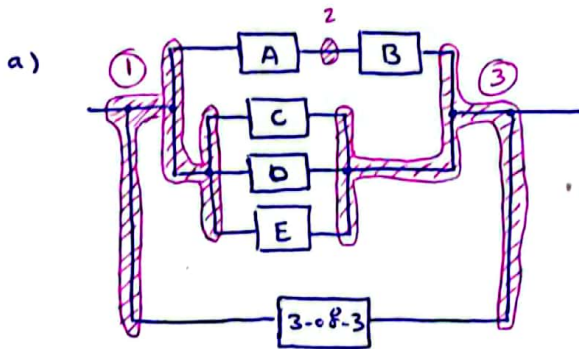


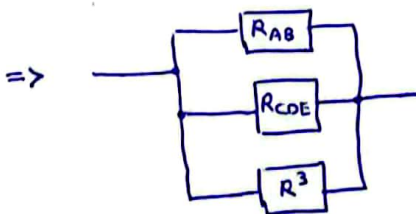
مطلوبات محاسب $R_{sys}(t)$ برای مدل های زیر:



I) $A \equiv B : R_{AB} = R_A \cdot R_B$

II) $C \parallel D \parallel E : R_{CDE} = 1 - (1 - R_C) \cdot (1 - R_D) \cdot (1 - R_E)$

III) $R_{m-o-R-n} = \sum_{i=m}^n \binom{n}{i} \cdot R_i(t) \cdot (1 - R)^{n-i} \xrightarrow{m=n=3}$
 $= \sum_{i=3}^3 \binom{3}{3} \cdot R^3(t) \cdot (1/R)^0 = R^3(t)$



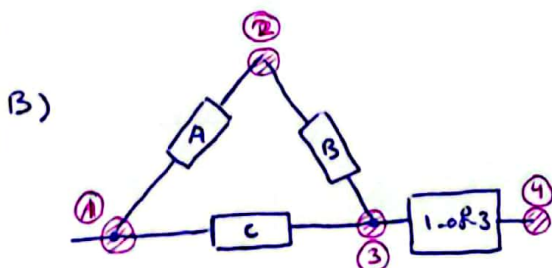
$\Rightarrow R_{AB} \parallel R_{CDE} \parallel R^3 : 1 - (1 - R_{AB}) \cdot (1 - R_{CDE}) \cdot (1 - R^3)$

$\Rightarrow R_{Intermediate}(t) = R_{AB} \parallel R_{CDE}$

$= 1 - (1 - R_A \cdot R_B) \cdot (1 - [1 - (1 - R_C)(1 - R_D)(1 - R_E)])$

$\Rightarrow R_{Total}(t) = R_{Intermediate} \parallel R^3$

$= 1 - (1 - R_{Intermediate}(t)) \cdot (1 - R^3(t))$



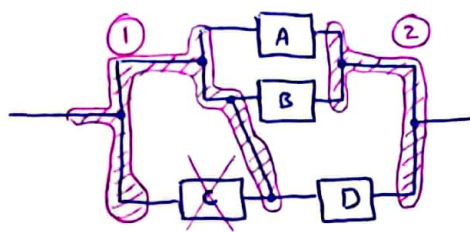
I) $A \equiv B : R_{AB} = R_A \cdot R_B$

II) $R_{AB} \parallel R_C : R_{ABC-combined}(t) = 1 - (1 - R_{AB}) \cdot (1 - R_C)$

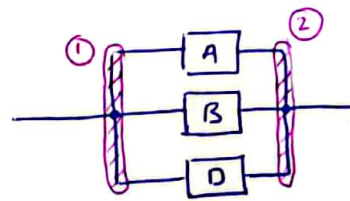
III) $R_{1-o-R-3} = \sum_{i=1}^3 \binom{3}{i} \cdot R_i(t) \cdot (1 - R_i(t))^{3-i}$
 $= 1 - (1 - R(t))^3$

$\Rightarrow R_{Total}(t) = R_{ABC-combined}(t) \cdot R_{1-o-R-3}(t) = [1 - (1 - R_A \cdot R_B) \cdot (1 - R_C)] \cdot [1 - (1 - R(t))^3]$

c)

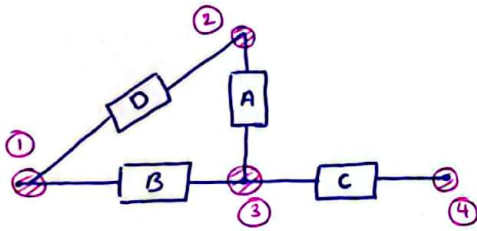


\equiv



$$R_{Total}(t) = 1 - (1 - R_A) \cdot (1 - R_B) \cdot (1 - R_D)$$

d)

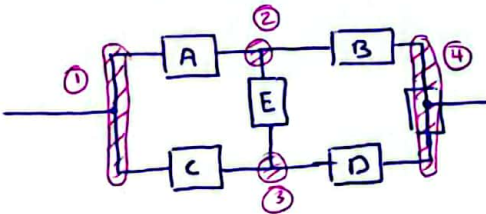


$$I) \text{ } B \text{ \& } A = D : R_{AD}(t) = R_A(t) \cdot R_D(t)$$

$$II) R_{AD} \parallel R_B : R_{Intermediate} = 1 - (1 - R_B) \cdot (1 - R_{AD}) \\ = 1 - (1 - R_B) \cdot (1 - R_A R_D)$$

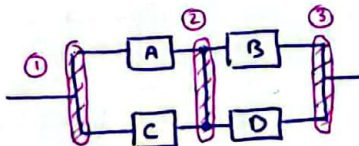
$$III) R_{Total}(t) = [1 - (1 - R_B) \cdot (1 - R_A R_D)] \cdot R_C$$

e)



دو حالت را برای E فرض می کنیم
 $\begin{cases} \uparrow : R_E = 1 & ① \\ \downarrow : R_E = 0 & ② \end{cases}$

(I)

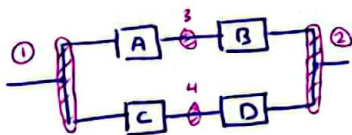


$$A \parallel C : R_{AC} = 1 - (1 - R_A) \cdot (1 - R_C)$$

$$B \parallel D : R_{BD} = 1 - (1 - R_B) \cdot (1 - R_D)$$

$$\Rightarrow R_{(I)} = [1 - (1 - R_A) \cdot (1 - R_C)] \cdot [1 - (1 - R_B) \cdot (1 - R_D)]$$

(II)



$$A = B : R_{AB}(t) = R_A R_B$$

$$C = D : R_{CD}(t) = R_C R_D$$

$$\Rightarrow R_{(II)} = 1 - (1 - R_A R_B) \cdot (1 - R_C R_D)$$

$$\Rightarrow R_{Total}(t) = R_E \cdot R_{(I)} + (1 - R_E) \cdot R_{(II)} = R_E \cdot [1 - (1 - R_A) \cdot (1 - R_C)] \cdot [1 - (1 - R_B) \cdot (1 - R_D)] \\ + (1 - R_E) \cdot [1 - (1 - R_A R_B) \cdot (1 - R_C R_D)]$$