(a),  $R_{2}(x)$ ,  $R_{3}(Y)$ ,  $R_{1}(X)$ ,  $R_{1}(Y)$ ,  $R_{2}(x)$ ,  $R_{3}(Y)$ ,  $W_{1}(x)$ ,  $W_{2}(x)$ ,  $R_{2}(Z)$ ,  $W_{2}(Z)$ 



(b). We need a transaction, as one single query can not use lock of data.