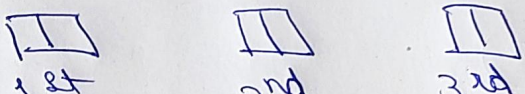
Three married couples are to be seated in a row having six seats in a cinema hall. If the spouses are to be seated next to each other, in how many ways can they be seated? Find the number of ways of their seating if all the ladies sit together.

Sol. Let us denote the married couples by S_1, S_2, S_3 where each couple is considered to be a single unit as shown in the following figure:



The number of ways in which the spouses can be seated next to each other is $3! = 6$ ways

Each couple can be seated in $2!$ ways.

$\Rightarrow$ Total arrangements $= 3! \times 2! \times 2! \times 2! = 48$

Also, if 3 ladies sit together, then necessarily three men must sit together. Thus, ladies & men can be arranged in $2!$ ways

$\Rightarrow$ $3! \times 3! \times 2! = 144$