Six new employees, two of whom are married to each other, are to be assigned six desks that are lined up in a row. If the assignment of employees to desks is made randomly, what is the probability that the married couple will have nonadjacent desks?

Solution: Total new employees = 6

So, they can be arranged in 6! Ways

$\therefore$ n (S) = 6! = 6 × 5 × 4 × 3 × 2 × 1 = 720

Two adjacent desks for married couple can be selected in 5 ways i.e. (1, 2), (2, 3), (3, 4), (4, 5), (5, 6)

Married couple can be arranged in the two desks in 2! Ways

Other four persons can be arranged in 4! Ways

So, number of ways in which married couple occupy adjacent desks

= 5 × 2! × 4!

= 5 × 2 × 1 × 4 × 3 × 2 × 1

= 240

So, number of ways in which married couple occupy non – adjacent desks = 6! – 240

= (6 × 5 × 4 × 3 × 2 × 1) – 240

= 720 – 240

= 480 = n (E)

Req. probability = No.of fav. Outcome / Total no. of outcomes

= n(E) / n(S)

=480/720

=2/3