

**A.** If the rate of mutation is  $10^{-5}$  per gene, it means that mutation occurs once in every 100 000 genes. There are approximately 40,000 genes in every human gamete. We can write the number of genes as a ratio:

40 000 : 100 000

2 : 5

It means that 5 gametes would be contain 2 new mutations. In other words, 2 out of 5 gametes would be contain a newly arisen mutation.

**B.** If the rate of mutation is  $10^{-4}$  per gene, it means that mutation occurs once in every 10 000 genes. The ratio is:

40 000 : 10 000

4 : 1

It means that each gamete would be contain at least 4 new mutations.