

A man has 7 relatives, 4 females and 3 males. His wife also has 7 relatives, 3 females and 4 males. The number of ways the couple can invite 3 male and 3 female relatives so that 3 of them are husband's relatives and 3 his wife's is,

- (A) 485 (B) 197 (C) 365 (D) None of these

Assume that the husband and wife do not have any common relative.

Solution

Case I:

Husband's Relatives – Males (3), Females (0)

Wife's Relatives – Males (0), Females (3)

$$\text{No. of ways} = {}^3C_3 \times {}^3C_3 = 1$$

Case II:

Husband's Relatives – Males (2), Females (1)

Wife's Relatives – Males (1), Females (2)

$$\text{No. of ways} = {}^3C_2 \times {}^4C_1 \times {}^4C_1 \times {}^3C_2 = 144$$

Case III:

Husband's Relatives – Males (1), Females (2)

Wife's Relatives – Males (2), Females (1)

$$\text{No. of ways} = {}^3C_1 \times {}^4C_2 \times {}^4C_2 \times {}^3C_1 = 324$$

Case IV:

Husband's Relatives – Males (0), Females (3)

Wife's Relatives – Males (3), Females (0)

$$\text{No. of ways} = {}^4C_3 \times {}^4C_3 = 16$$

$$\text{Total number of ways} = 1 + 144 + 324 + 16 = 485$$

Hence, (A)