Permutations Ex 16.4 Q9

Let two husbands A, B be selected out of seven males in = ${}^7C_2$ ways. excluding their wives, we have to select two ladies C, D out of remaining 5 wives is = ${}^5C_2$ ways. Thus, number of ways of selecting the players for mixed double is = ${}^7C_2 \times {}^5C_2$

$$= 21 \times 10$$
$$= 210$$

Now, suppose A chooses C as partner $(B$ will automatically go to $D)$ or
A chooses D as partner $(B$ will automatically go to $C)$
Thus we have, 4 other ways for teams.

Required number of ways = $210 \times 4 = 840$

Permutations Ex 16.4 Q10

m men can be seated in a row in ${}^mP_m = m!$ ways.

Now, in the $(m+1)$ gaps n women can be arranged in ${}^{m+1}P_n$ ways.

Hence, the number of ways in which no two women sit together

$$= m! \times {}^{m+1}P_n$$
$$= m! \times \frac{(m+1)!}{(m+1-n)!}$$
$$= m! \times \frac{(m+1)!}{(m-n+1)!}$$

Hence, proved

Permutations Ex 16.4 Q11

(i) M O N D A Y has 6 letters with no repetitions, so

Number of words using 4 letters at a time with no repetitions = ${}^6P_4$

$$= \frac{6!}{2!}$$
$$= 360$$

(ii) Number of words using all 6 letters at a time with no repetitions = ${}^6P_6$

$$= \frac{6!}{(6-6)!}$$
$$= 6 \times 5 \times 4 \times 3 \times 2 \times 1$$
$$= 720$$

(iii) Number of words using all 6 letters, starting with vowels

$$= 2.{}^5P_5$$
$$= 2 \times 5 \times 4 \times 3 \times 2 \times 1$$
$$= 240$$

Permutations Ex 16.4 Q12

There are 8 letters in the word 'ORIENTAL'. The total number of three letter words is the number of arrangements of 8 items, taken 3 at a time, which is equal to

$${}^8P_3 = \frac{8!}{(8-3)!}$$
$$= \frac{8!}{5!}$$
$$= \frac{8 \times 7 \times 6 \times 5!}{8!}$$
$$= 336.$$

Hence, the total number three letter words are 336.

*********** END **********