Permutations Ex 16.3 Q30

The even number so last digit must be even .We can so number patterns are
1)odd, odd, even
2)odd, even, even
3)even, odd, even
4)even, even, even

For the pattern 1 - number of ways of choosing 1st digit is 3
2nd digit (already one is gone) is 2
3rd is 3
Therefore, the no of ways is 3x2x3 .
Similarly for pattern 2, the no. of ways is 3x3x2
for pattern 3, the no. of ways is 3x3x2
for pattern 4, the no. of ways is 3x2x1

Total no of ways is 3x2x3 + 3x3x2 + 3x3x2 + 3x2x1
18x3 + 6 = 60

Permutations Ex 16.3 Q31

We can take the digits one at a time, starting at either end.
Let's start from the right.
d c b a = the digits to be chosen.
For a we have 5 choices (1,2,3,4,5)
For b we only have 4 (having used one for a, and repeats not allowed)
For c we have 3
For d we have 2.
5 * 4 * 3 * 2 = 120 choices overall

If we want the number to be even,
we don't have 5 choices for a, we are limited to the set {2, 4}
there are only two digits available.

But for the remaining digits the calculation is the same.
2/5 of the numbers are even $= \frac{2}{5}\times 120 = 48 = 2\times 4\times 3\times 2$

Permutations Ex 16.3 Q32

There are 6 letters in the word 'EAMCOT'. Out of these letters 'E','A' and 'O' are the three vowels.

The remaining three consonants can be arranged in ${}^3P_3$ ways. In each of these arrangements 4 places are created, shown by the cross marks.

$$\boxed{\times \quad \mathrm{V} \quad \times \quad \mathrm{V} \quad \times \quad \mathrm{V} \quad \times}$$

Since no two vowels are to be placed adjacent to each other, so we may arrange 3 vowels in 4 places in ${}^4P_3$ ways.

The total number of arrangements

$= {}^3P_3 \times {}^4P_3$

$= 3! \times 4!$

$= 144$

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