Colourings[*k*, *o*] gives the number of colourings of the knot k, which is given in modified DT form onto the permutation group S_o.

```
Colourings[k_MDT, o_Integer] := Colourings[k, o] = If[k === MDT[],
    Length /@ (Sort[Length /@ (List @@ PermutationCycles@#)[[1]]] &
       // GroupBy[Permutations@Range@o, #] &
      // Values),
    Block[{e = EdgeSequence@k, s, v, w = List @@@ List @@ ToPD@k},
     s = SortBy[If[Order[Position[Join @@ e, #[[1]]],
                 Position[Join @@ e, #[[3]]]] == 1,
               #, Reverse@#] & /@
            (w //. (Max@# → Min@# & /@ w[[ ;; , {3, 5}]]))ᵀ[[2 ;; 4]]ᵀ,
       Max@Table[Position[Join @@ e, #[[j]]], {j, 2}] &];
     Total /@ Table[If[ValidColouring[k, e, s, g], 1, 0],
       {p, (Length /@ (List @@ PermutationCycles@#)[[1]]
            // Sort) &
         // GroupBy[Permutations@Range@o, #] &
        // Values},
       {g, Tuples[p, Length@e[[1]]]}]]];
```