Distinguishable Permutation

Total points = 68

Problem Set

A.

1. $n = 8$ ✓
   $p = 2$ ✓
   $q = 3$ ✓
   $P = \frac{n!}{p!q!}$ ✓
   $P = \frac{8!}{2!3!}$ ✓
   $= \frac{(8)(7)(6)(5)(4)(3!)}{(2)(1)(3!)}$ ✓
   $= \boxed{3,360}$ ✓distinguishable permutations ✓
2. $n = 10$ ✓
   $p = 2$ ✓
   $q = 2$ ✓
   $r = 2$ ✓
   $P = \frac{n!}{p!q!r!}$ ✓
   $P = \frac{10!}{2!2!2!}$ ✓
   $= \frac{(10)(9)(8)(7)(6)(5)(4)(3)(2!)}{(2!)(2)(1)(2)(1)}$ ✓
   $= \boxed{453,600}$ ✓distinguishable permutations ✓
3. $n = 11$ ✓
   $p = 3$ ✓
   $q = 3$ ✓
   $P = \frac{n!}{p!q!}$ ✓
   $P = \frac{11!}{3!3!}$ ✓
   $= \frac{(11)(10)(9)(8)(7)(6)(5)(4)(3!)}{(3!)(3)(2)(1)}$ ✓
   $= \boxed{1,108,800}$ ✓ distinguishable permutations ✓
4. $n = 10$ ✓
   $p = 2$ ✓
   $q = 3$ ✓
   $r = 2$ ✓
   $P = \frac{n!}{p!q!r!}$ ✓
   $P = \frac{10!}{2!3!2!}$ ✓
   $= \frac{(10)(9)(8)(7)(6)(5)(4)(3!)}{(2)(1)(3!)(2)(1)}$ ✓
   $= \boxed{151,200}$ ✓distinguishable permutations ✓
5. $n = 11$ ✓
   $p = 4$ ✓
   $q = 4$ ✓
   $r = 2$ ✓
   $P = \frac{n!}{p!q!r!}$ ✓
   $P = \frac{11!}{4!4!2!}$ ✓
   $= \frac{(11)(10)(9)(8)(7)(6)(5)(4!)}{(4!)(4)(3)(2)(1)(2)(1)}$ ✓
   $= \boxed{34,650}$ ✓distinguishable permutations ✓

B.

1. $n = 10$ ✓
   $p = 4$ ✓
   $q = 6$ ✓
   $P = \frac{n!}{p!q!}$ ✓
   $P = \frac{10!}{4!6!}$ ✓
   $= \frac{(10)(9)(8)(7)(6!)}{(4)(3)(2)(1)(6!)}$ ✓
   $= \boxed{210}$ ✓ways ✓
2. $n = 8$ ✓
   $p = 2$ ✓
   $q = 2$ ✓
   $r = 2$ ✓
   $P = \frac{n!}{p!q!r!}$ ✓
   $P = \frac{8!}{2!2!2!}$ ✓
   $= \frac{(8)(7)(6)(5)(4)(3)(2!)}{(2!)(2)(1)(2)(1)}$ ✓
   $= \boxed{5,040}$ ✓distinguishable permutations ✓
3. $n = 6$ ✓
   $p = 2$ ✓
   $q = 3$ ✓
   $P = \frac{n!}{p!q!}$ ✓
   $P = \frac{6!}{2!3!}$ ✓
   $= \frac{(6)(5)(4)(3!)}{(2)(1)(3!)}$ ✓
   $= \boxed{60}$ ✓distinguishable permutations ✓

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4. $n = 10$ ✓
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