Basics of counting

1. Students are taking a multiple choice quiz with 8 questions. Each question has 5 possible answers
   (a) In how many ways can a student answer all the questions on the quiz if the student answers every question?
   (b) In how many ways can a student answer all the questions on the quiz if questions can be left blank?
2. How many different 2 letter initials with none of the letters repeated can people have?
3. How many bit strings of length 5 or less are there?
4. How many four element DNA sequences
   (a) Do not contain A?
   (b) Have G as the second base?
5. How many strings of six lower case letters:
   (a) Start with cz (in that order).
   (b) End with cz (in that order).
   (c) Both start and end with cz (in that order).
6. How many positive integers between 100 and 999 are divisible by 7 but not 4?
7. New Zealand license plates are either three digits followed by four letters, or four digits followed by three letters. How many possible New Zealand licenses are there?
8. Brooklyn Marble Ice Cream's Colossus of Rhodes Sundae contains five scoops of ice cream stacked in a column. If exactly 4 different flavors are used, how many different sundaes can be created?

Source: Rosen's *Discrete Mathematics and its Applications*.