Quiz Questions: Counting

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1. How many bit strings (strings of 0's and 1's) are there of length 8 that have more 0's than 1's?
   A. $\frac{2^8 - C(8,4)}{2}$
   B. $C(8,3) + C(8,2) + C(8,1)$
   C. $C(7,3) + C(7,2) + C(7,1) + C(7,0)$
   D. $\frac{2^8}{2}$

2. There are 7 women and 13 men. How many ways are there to form a committee of size 6 with equal number of women and men?
   A. $6!$
   B. $3! \times 3!$
   C. 2^6
   D. $C(7,3)C(13,3)$

3. How many ways you can distribute 13 distinguishable balls among 4 distinguishable boxes? (boxes can be empty)
   A. $13 \times 12 \times 11 \times 10$
   B. 4^{13}
   C. $C(16,4)$
   D. $C(13,4)$

4. Number of different license plates with 4 letters that cannot be repeated followed by 2 digits that can be repeated?
   A. $10^2 \times 26^4$
   B. $10^2\ C(26,4)$
   C. $C(10,2)\ C(26,4)$
   D. $26 \times 25 \times 24 \times 23 \times 10^2$

5. You have a deck of 52 playing cards. How many possible 6-cards poker hands contain exactly one ace and one king?
   A. $C(4,1)C(4,1)C(50,4)$
   B. $C(8,2)C(44,4)$
   C. $4 \times 4 \times C(44,4)$
   D. $C(8,2)C(44,4) \times 6!$

6. 7 red and 8 blue balls inside a bin. How many balls one must take out randomly to be sure to have at least 1 red ball?
   A. 1
   B. 2
   C. 8

D. 9

7. What is the coefficient of x^5 in the expansion of $(x+4)^{14}$?
   A. $4^9C(14,9)$
   B. $C(14,0)+C(14,1)+C(14,2)+C(14,3)+C(14,4)+C(14,5)$
   C. $C(14,5)$
   D. $2\times 4^9C(14,5)$

8. How many integers with 4 decimal digits are divisible by 3?
   A. 3000
   B. 3001
   C. 2999
   D. 2998

Answers:

1. A
2. D
3. B
4. D
5. C
6. D
7. A
8. A