KING SAUD UNIVERSITY

COLLEGE OF COMPUTER & INFORMATION SCIENCES

DEPT OF COMPUTER SCIENCE

CSC281 Discrete Mathematics for CS Students

Practice Questions (Final)

1. The car plate board in Saudi Arabia has the form: A #, where # is any number 1 to 9999, and A is a three letter in the range A-Z. How many car plate boards can you have?

2. Find the coefficient of the smallest and largest power of x in the expansion of $(3x + 2x^2 + 4/x)^{100}$.

3. How many base 3 strings of length 10 that starts with 000, or 222?

4. How many positive integers between 25 and 134 that are divisible by 4 and by 6 at the same time?

5. English alphabet has 21 consonants and 5 vowels. How many strings of length 6 of lowercase letters that has no vowels? Exactly 2 vowels? At least 2 vowels?

6. Solve the recurrence relation: $a_n = 3a_{n-1} + 2a_{n-2}$ with initial conditions $a_0 = 0$, $a_1 = 5$.

7. Convert the number 123 (in base 6) to a number in base 9.

8. Write the sequence generated by the GF $\dfrac{1+x+x^2}{(1-x)^2}$.

9. Derive the recurrence relation to count the number of bit strings of length *n* that has the pattern 101.

10. Prove using induction that for all $n \geq 1$,

$$\sum_{k=1}^{n} \frac{1}{k(k+1)} = \frac{n}{n+1}.$$