**1.21**

（b）根据重合指数法得：

m=1时 重合指数为 0.0437

m=2时 重合指数为 0.044，0.053

m=3时 重合指数为0.064，0.057，0.057

m=4时 重合指数为0.049，0.0549，0.0499，0.0609

m=5时 重合指数为0.057，0.057，0.047，0.050，0.0579

m=6时 重合指数为0.079，0.100，0.066，0.081，0.060，0.090

所以密钥长度为6

令；

求Mg（）得：

i=1时 Mg(2)= 0.090

i=2时 Mg(17)= 0.071

i=3时 Mg(24)= 0.059

i=4时 Mg(15) = 0.066

i=5时 Mg(19)= 0.056

i=6时 Mg(14)=0.070

密钥K =（2,17,24,15,19,14）

可得明文如下：

I learned how to calculate the amount of paper needed for a room when I was at school. you multiply the square foot age of the walls by the cubic contents of the floor and ceiling combined and double it, you then allow half the total for openings such as windows and doors .Then you allow the other half for matching the pattern. Then you double the whole thing again to give a margin of error and then you order the paper.

（c）密文中26个字母出现的频率如下：

A = 13 N = 1

B = 21 O = 2

C = 32 P = 20

D = 9 Q = 4

E = 13 R = 12

F = 10 S = 1

G = 0 T = 0

H = 1 U = 6

I = 16 V = 4

J = 6 W = 0

K = 20 X = 2

L = 0 Y = 1

M = 0 Z = 4

猜想C是e的加密，B是t的加密

得方程组：

解得：

密约合法；

解密算法为：.

得明文（加拿大国歌法语版）：

OCanada! Terre de nos a?eux,

Ton front est ceint de fleurons glorieux!

Car ton bras sait porter l'épée,

Il sait porter la croix!

Ton histoire est une épopée

Des plus brillants exploits.

Et ta valeur de foi trempé

Protégera nos foyers et nos droits;

Protégera nos foyers et nos droit**s**