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1)
44 54 11 34 54 11 23 33 53 44 54 12 42 43 42 44 32 51 41 21 23 11 31 13 53 15 54 42 54 42 44 42
43 44 32 51 41 53 43 54 32 42 34 41 11 25 51 35 53 34 13 42 43 22 53 43 11 44 54 34 53 43 22 51
34 31 42 14 32 51 34 12 53 34 12 15 54 15 34 51 33 51 44 44 11 22 51 44 42 54 42 44 44 15 34 51
23 55 15 43 21 34 51 11 13 11 21 23 51 42 54 31 53 33 21 42 43 51 44 53 15 34 14 34 51 25 42 53
15 44 33 51 54 32 53 41 44 34 35 13 54

start almost finished black out it is in shed on third ave working on a stronger cipher for future messages it is surely unbreakable it combine sour previous methods rwkt

2) python script has also been attached on how i did it.
6c73d5240a948c86981bc2808548 --attack at dawn
6c73d5240a948c86981bc294814d --attack at dusk

3)

$P[M=a] = 1/4 \qquad P[M=b] = 3/4$

$P[K=K_1] = 1/2 \qquad P[K=K_2] = P[K=K_3] = 1/4$

$P[C=1] = P[M=a] * P[K=K_1] = \frac{1}{4} \times \frac{1}{2} = \frac{1}{8}$

$P[C=2] = P[M=a] * P[K=K_2] + P[M=b] * P[K=K_1]$

$= \frac{1}{4} \times \frac{1}{4} + \frac{3}{4} \times \frac{1}{2}$

$= \frac{1}{16} + \frac{3}{8} = \frac{7}{16}$

$P[C=3] = P[M=a] * P[K=K_3] + P[M=b] * P[K=K_2]$

$= \frac{1}{4} \times \frac{1}{4} + \frac{3}{4} \times \frac{1}{4}$

$= \frac{4}{16} = \frac{1}{4}$

$P[C=4] = P[M=b] * P[K=K_3]$

$= \frac{3}{4} \times \frac{1}{4} = \frac{3}{16}$

$$P[M=a \mid C=1] = \frac{P[M=a] * P[k=k_1]}{P[C=1]} = 1$$

$$P[M=a \mid C=4] = 0$$

$$P[M=a \mid C=2] = \frac{P[M=a] * P[k=k_2]}{P[C=2]} = \frac{\frac{1}{16}}{\frac{1}{16}} = \frac{1}{4}$$

$$P[M=a \mid C=3] = \frac{P(M=a) * P(k=k_3)}{P(C=3)} = \frac{\frac{1}{16}}{\frac{4}{16}} = \frac{1}{4}$$

$$P[M=b \mid C=1] = 0$$

$$P[M=b \mid C=4] = 1$$

$$P[M=b \mid C=2] = \frac{P(M=b) * P[k=k_1]}{P[C=2]} = \frac{\frac{3}{8}}{\frac{1}{16}} = \frac{6}{7}$$

$$P[M=b \mid C=3] = \frac{P[M=b] * P(k=k_2]}{P[C=3]} = \frac{3}{4}$$