**Unit 1 Practice Test Key Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

1. Encrypt ‘Enterprise’ using a Caesar Cipher with a shift of +11. PYEPCACTDP
2. Crack this Caesar-shifted message: LIVE LONG AND PROSPER

SPCL SVUN HUK WYVZWLY

1. The ADFGX cipher combines substitution with transposition. Explain why this makes it so difficult to crack. Can’t use frequency analysis; can’t use anagramming
2. This message was encoded using a simple columnar transposition cipher, with no junk characters. (Spacing is for transcription convenience.) Crack it.

THHSE IXLEI AEAPT NUATM KSNLH ANQEE EECAE BTURT CECMO IIT

TAKE THESE CHANCES PLACE THEM IN A BOX UNTIL A QUIETER TIME

1. Encipher “the Force will be with you, always” using a keyword columnar transposition cipher with keyword “Kenobi”. Use “x” to fill the rectangle.

OLTLXHEEOYRLHWXTCBYAEWWUSFIIAX

1. Use a keyword substitution cipher with the keyword “IPHONEX”.
   1. Encrypt THE NOTCH IS WEIRD LOOKING SANJKSHABRVNBQOFKKDBJX
   2. Decrypt VAIS BR VQKJX VBSA SAN JTGPNQ JBJN IJYVIY WHAT IS WRONG WITH THE NUMBER NINE ANYWAY
2. Using a Vigenere cipher with the keyword “PAWNEE”
   1. Encrypt: PARKS AND RECREATION EANXWECDNRGVTAPVSR
   2. Decrypt: EOAGMGCOXYIPPNZZIVBAEQ POETIC NOBLE LAND MERMAID
3. Use a Playfair cipher with keyword THANOS (do not include J in your matrix) to encrypt “INFINITY STONE”. KAGKAKNVFSTOCZ
4. **Crack** the following Playfair cipher which is known to begin “WHETHER YOU … “: (8 pts)

WHETHER YOU THINK YOU CAN OR THINK YOU CAN’T YOU ARE RIGHT

RF LZ LC KX WV PL GQ DK

WV DB VB SP IL QO VK XA

BM QZ WV CW CS LH LP

1. A ciphertext had the following counts of letters (there are 1823 total letters

in the ciphertext).

|  |  |
| --- | --- |
| **Letters** | A B C D E F G H I J K L M |
| **Counts** | 61 60 68 50 83 38 48 61 107 54 62 107 114 |

|  |  |
| --- | --- |
| **Letters** | N O P Q R S T U V W X Y Z |
| **Counts** | 97 71 74 25 43 36 96 42 73 85 69 97 102 |

1. Determine the index of coincidence for this ciphertext. What does this result suggest about the encryption method? 0.04258
2. Assuming the encryption is Vigenere, estimate the keyword length of the cipher. 6.5933
3. Looking at repeated trigraphs in the ciphertext, you discover that the three most common distances between repeated trigraph instances are 84 characters, 49 characters, and 210 characters. What does this indicate? To what degree does it support your answer in part b? The keyword length is probably 7
4. Decode this message, which was encoded using a rail fence cipher. (Spacing is for transcription convenience.)

AHTAA AILTE ITENS RMRHN LLLTE CG ALL THE LITTLE ANTS ARE MARCHING

1. Use the ADFGX cipher with the following matrix and the keyword “STIPE”,
   1. encrypt the message “LIVING WELL” AXFDXFGDFGGXXAFDDXXX
   2. decrypt the message FDXAFXFDDGDAFAAXDDFGFXAAAFDF THE BEST REVENGE

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **A** | **D** | **F** | **G** | **X** |
| **A** | V | M | B | O | Z |
| **D** | T | C | P | A | Y |
| **F** | S | E | U | D | G |
| **G** | K | X | Q | W | N |
| **X** | H | L | I | R | F |