LGS Year 9 Learner Week

Codebreaking

Name: .....

Date: .....

1. What does the word ***encryption*** mean?

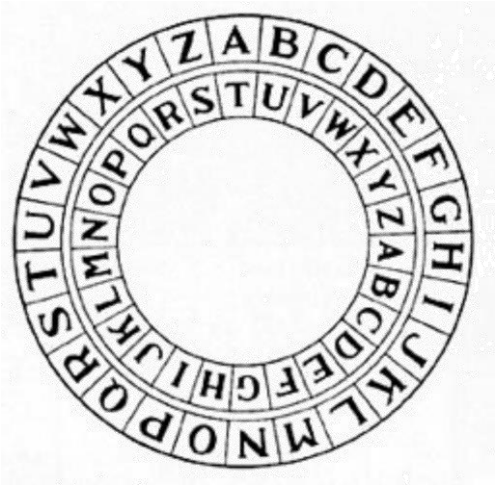
.....

.....

..... **[2]**

2. **Figure 1** shows a message being encrypted using a Caesar cipher.

Figure 1



Plaintext: MONKEY

Ciphertext: FHGDXR

a) Encrypt the plaintext "COMPUTING" using the Caesar cipher with the settings shown in **Figure 1**.

..... **[1]**

b) Decrypt the ciphertext "IRMAHG" using the Caesar cipher with the settings shown in **Figure 1**.

..... **[1]**

3. Intelligence headquarters have intercepted a handwritten message from a spy. The message has been encrypted. In a separate development another secret agent has been caught. Amongst her documents a key has been discovered.

Figure 2 shows the discovered key and the message that has been intercepted.

Figure 2

The discovered key

a	b	c	d	e	f	g	h	i	j	k	l	m
n	h	x	y	l	p	t	j	r	u	q	v	z
n	o	p	q	r	s	t	u	v	w	x	y	z
m	g	o	s	w	i	d	a	e	k	c	f	b

The encrypted message

n d d n x q n d y n k m

Can you use the key to crack the intercepted message?

Decrypted message: ..... **[1]**

4. The following famous quote has been encrypted using the Caesar cipher but word length and letter cases have been obscured.

PRDBE JITGL DJASS THTGK TIDQT RPAAT SXCIT AAXVT CIXUX IRDJA
SSTRT XKTPW JBPCX CIDQT AXTKX CVIWP IXILP HWJBP C

Use some basic frequency analysis to decrypt the message.
Start by counting the occurrence of each letter in the code and writing their frequency in the table …

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

[3]

Clue: The most frequently occurring letter in the English alphabet is **E** followed by **T, A, O, I** and **N**. The least frequent are **Z, X, Q, J** and **K**.

Use your frequency analysis to work out how many letter shifts have been applied to the original quote and then decipher the original quote.

Size of shift: ..... **[1]**

Original quote: .....

.....

.....

..... **[2]**

5. Wi-Fi hotspots in coffee shops, libraries, airports, hotels and other public places are convenient but often they are not secure. Find out …

a) why public Wi-Fi hotspots are not secure?

.....

..... **[1]**

b) when is it unsafe to use them?

.....

..... **[1]**

c) why is it unsafe to use them?

.....

..... **[1]**

TOTAL: 14