



SCIENCE OLYMPIAD
— AT THE —
UNIVERSITY OF FLORIDA

Northern Regional: January 19th, 2019

Code Busters C Test

Name(s): _____

Team Name: _____

School Name: _____

Team Number: _____

Rank: _____

Score: _____

Time (official use only):

Timed Question [100 Points]: Solve the following Aristocrat. Once solved, raise your hand so that your proctor may check your answer and record your time. 10 minutes before bonus is gone!

**GKFI OWMAI KI IAU LKC W IAWON IAKI W AKT
IHH**

JVRA IH TCWON.

Ciphertext Frequency Table

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y
6		2			1	1	3	9	1	5	1	1	2	3			1		2	1	1	5		

1) Decrypt the following Atbash Cipher [100 Points].

**ZUGVI Z OLMT WZB LU DLIP, SV WVXRWWV GSZG
SV MVVWWV GL GZPV Z YIVZP.**

2) Decrypt the following Aristocrat [200 points].

QD QFFSY Q RQZ AYYFK MPY RGWMGL QNQZ.

3) Encrypt the Affine Cipher with the key $a=7$ and $b=14$ [250 Points].

**Once upon a time, a man named John crossed the street
to go get some water from the well. As he crossed the
street on the way back, he spilled the water and had to
return for more.**

4) Decrypt the following Vigenere Cipher using the key "SWEET" [300 Points].

**Tevhl sni oggsr xh eekvtla jvhe lpevw ps tesyi xh
hkwmmakr xawiwenaw mg s hsgtlesr papl e lmexeuda
xifhavemmni jhj plif lk xlkari.**

5) Compute the decryption matrix of the following encryption matrix of a 2x2 Hill Cipher [500 Points].

$$\begin{bmatrix} 5 & 7 \\ 5 & 12 \end{bmatrix}$$

6) The following symbols encode a phrase using the Baconian alphabet. What does it say? [300 points]

----- + + + + _ + ----- + ----- + ----- + ----- + + + + ----- + _ + ----- + -----
 + _ + ----- + _ _

7) Decrypt the following Spanish Xenocrypt [500 Points].

AY LAYZW AD JYGD EFD CLGDQ VL SLQDL SD LMFJL DO VL

DRGFDVL.

8) Decrypt the following Patristocrat where the ciphertext letters “QPP” decrypt to “TOO” [450 Points].

TUYXUQPPWPAWUXAUSYHPVQLPTOVWLOPAUCTULYEUYASAP

QYHPVQLPTLYJJCTUYXU

9) Decrypt the following Cipher [250 Points].

**esp mpde hlj ez xlitxtpk azhpc qzc esp pyetcp ntej hzfwo mp
ez mzes xtytptkp pypcrj nzydfxaetzy ld hpww ld tyncpldp pypcrj
rpypcletzy.**

10) Encrypt the following Vigenere cipher with the key “WACKO” [250 Points].

**Failure is the fog through which we glimpse triumph. A world
without failure is a world without success.**

11) Encrypt the following affine cipher using the key: $a=9$ and $b=18$ [250 Points].

**My father once told me that robots were going to take over the world. I did
not believe him at first, but now I am starting to rethink it.**

12) Decrypt the following Aristocrat [350 Points].

**RV QDTSKURODT RGS UBONS VI HDIHDHRL, LVQ YQUR
EHRQKS ODT SDTNSUU OKKOL VI VWCSBRU VK
DQYWSKU. SZSD AGHNS TVHDP UV, HR YOL WS
THIIHBQNR RV PKOUE.**

13) Decrypt the following Patristocrat where the ciphertext letters “RHH” decrypt to “ALL” [600 Points].

RTEXGRHHQTECXCRGSFQGOECREUJPEUBUEXBSXSPJJ

RVUBLQTTRZFXFBECXBREUQBRHMCRIJUQBZCUJ.

14) Decrypt the following atbash cipher [200 Points].

GSV NZM RM GSV SZG DZOPVW ZXILHH GSV HGIVVG LMOB GL

URMW ZM VNKGB DZIVSLFHV.

15) Decrypt the following Caesar Cipher [250 Points].

XOD SYXSM OAEKDSYXC KBO LKVXMON OAEKDSYXC

GRSMR NY XYD SXMVENO DRO KAEOYEC SYXC ZBOCOXD

SX SYXSM OAEKDSYXC YX LYDR CSNOC.

16) Decrypt the following Aristocrat [400 Points].

**HRC WLVGCJAC VA QWPP NQ FEAHCJVCA. MC RYGC
FNJC**

SWCAHVNLA YXNWH VH HRYL MC IN YLAMCJA.

17) Decrypt the following Vigenere Cipher using the key “PET” [300 Points].

**ljm kbcp gh ipy visoa eg esermxvvmgp bsqcc kjwyyf fw vw krv
jatax cneug. ipgjsmip mg ymdn ji qkjxkkyyv, efablvpk au**

Xsfumtnm.

18) Decrypt the following Aristocrat [200 Points].

**DS DJ RXLY SK TKWILURUGY RKV CXLOU SRU BGDPUJLJ DJ, AUS
VU RXPU GKS EKBGY XGA CDEU FBS VRXS DJ RULU KG UXLSR.**

19) Compute the decryption matrix of the following encryption matrix of a 2x2 Hill Cipher [400 Points].

$$\begin{bmatrix} 8 & 9 \\ 7 & 4 \end{bmatrix}$$

20) Decrypt the following Aristocrat [350 Points].

**EUXYBUVH WK KUXYLEWDZ LEGL XGDM KLRIYDLK IU
DUL CWHY, ARL WL WK KUXYLEWDZ LEGL BY GCC
EGSY LU IU.**