INFORMATION ASSURANCE AND SECURITY 2 – Cipher Quiz Solutions

1. Vigenère Cipher (Encryption)

```
Key = SURVIVE
Plaintext = THE CHANCES OF LIFE AND DEATH

Steps:
1. Remove spaces: THECHANCESOFLIFEANDDEATH
2. Repeat key: SURVIVESURVIVESURVIVESURV
3. Encrypt: C = (P + K) mod 26
   Example: T(19)+S(18)=37→11=L, H(7)+U(20)=27→1=B, E(4)+R(17)=21→V, C(2)+I(8)=10→K
4. Continue for all letters.
Ciphertext: LBVXPVRUYJJNGMXYRILYISNY

Final Answer (box this):
[ LBVXPVRUYJJNGMXYRILYISNY ]
```

2. Caesar Shift Cipher (Decryption)

```
Key = 11
Ciphertext = QTRSELYONZYBFPC

Steps:
1. Convert each letter A=0..Z=25.
2. Decrypt: P = (C - 11) mod 26.
   Example: Q(16)-11=5→F, T(19)-11=8→I, R(17)-11=6→G, S(18)-11=7→H.
3. Continue for all letters.
Plaintext: FIGHTANDCONQUER

Final Answer:
[ FIGHTANDCONQUER ]
```

3. Atbash Cipher

```
Ciphertext: RGRHZNZGGVILUORUVZMWVZGS
Rule: Replace each letter with its Atbash opposite (A↔Z, B↔Y, ..., M↔N).

Plaintext: ITISAMATTEROFLIFEANDEATH

Final Answer:
[ ITISAMATTEROFLIFEANDEATH ]
```

4. Pigpen Cipher (Image 1)

```
Steps:
1. Draw the pigpen grid key.
2. Decode each symbol.
Plaintext: INFORMATION

Final Answer:
[ INFORMATION ]
```

5. Pigpen Cipher (Image 2)

```
Steps:
1. Draw the pigpen grid key.
2. Decode each symbol.
Plaintext: SECURITYBREACHDETECTED

Final Answer:
[ SECURITYBREACHDETECTED ]
```

6. Vigenère Cipher (Decryption)

```
Key = WAR
Ciphertext = OKZHLMVQLCAAUAR
Steps:
1. Repeat key: WARWARWARWARWAR
2. Decrypt: P = (C - K) mod 26.
Plaintext: DEFENDTHEBASE

Final Answer:
[ DEFENDTHEBASE ]
```

7. Hill Cipher (Encryption)

```
Key = JAZZ → Matrix [[9,0],[25,25]]
Plaintext = ZEST

Steps:
1. Convert letters: Z(25)E(4), S(18)T(19)
2. Multiply each digraph by key mod 26.
Ciphertext digraphs: RX, GP → RXGP

Final Answer:
[ RXGP ]
```

8. Hill Cipher (Decryption)

```
Key = JAZZ
Ciphertext = MDKA

Steps:
1. Build K=[[9,0],[25,25]], find det=17, det■¹=23.
2. K■¹ = [[3,0],[23,25]].
3. Multiply K■¹ * (12,3)=(K N), (10,0)=(E W)
Plaintext: KNEW

Final Answer:
[ KNEW ]
```

9. Playfair Cipher

```
Key = FIVE
Ciphertext = CVTGKOGYSZ

Steps:
1. Create Playfair grid (combine I/J).
2. Split ciphertext: CV TG KO GY SZ.
3. Apply decryption rules.
Plaintext: DISHONESTY

Final Answer:
[ DISHONESTY ]
```