INSTITUTE OF COMPUTER TECHNOLOGY

B-TECH COMPUTER SCIENCE ENGINEERING 2025-26

SUBJECT:-CRYPTOGRAPHY

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BRANCH: CYBER SECURITY

BATCH: 52

PRACTICAL_5

Aim: To understand the concept of Transposition Ciphers by implementing the Rail Fence Cipher for both encryption and decryption, and to analyze how transposition differs from substitution in terms of security and attack methods.

CODE:

```python
def encrypt(plain_text, key):
    cipher_text = [''] * key
    row = 0
    direction_down = False

    for char in plain_text:
        if row == 0 or row == key - 1:
            direction_down = not direction_down
        cipher_text[row] += char
        row += 1 if direction_down else -1

    return ''.join(cipher_text)

def decrypt(cipher_text, key):
    rail = [''] * key
    row = 0
    direction_down = None

    for char in cipher_text:
        if row == 0:
            direction_down = True
        if row == key - 1:
            direction_down = False

        rail[row] += char
        row += 1 if direction_down else -1

    return ''.join(rail)

if __name__ == "__main__":
    text = "HELLORAILFENCECIPHER"
    for key in range(2,5):
        print(f"Key: {key}")
        encrypted = encrypt(text, key)
        print("Encrypted:", encrypted)

        decrypted = decrypt(encrypted, key)
        print("Decrypted:", decrypted)
```

OUTPUT:

```
[Running] python -u "c:\Users\Hp\OneDrive\Desktop\SEM_05\Cryptography\Practicals_source_code\practical5_1.py"
Key: 2
Encrypted: HLOALECCPEELRIFNEIHR
Decrypted: HOLCPERFEHLAECELINIR
Key: 3
Encrypted: HOLCPELRIFNEIHRLAECE
Decrypted: HPIIAOCERFEHLEELLNRC
Key: 4
Encrypted: HACEERINEHRLOLECPLFI
Decrypted: HIOFARNLLLICEEREPEHC
```