Assignment

Q1) What substitution system results when we use a 1x25 Playfair matrix?

Ans: A 1x25 Playfair matrix is essentially a single row containing all 25 letters of the alphabet (excluding 'J'). Unlike the traditional 5x5 Playfair cipher, which operates on digraphs (pairs of letters), a 1x25 matrix lacks a 2D structure, meaning that it behaves more like a simple shift cipher rather than a traditional Playfair system.

One possible substitution system using 1x25 matrix could be:

→ Assign numbers to each letter based on its position in the row

→ Encrypt letters using a modulo-based shift system

→ Thus, a 1x25 Playfair matrix effectively reduces to a simple monoalphabetic substitution or shift cipher rather than true

Playfair encryption

Q2) construct a playfair matrix with the key "algorithm".

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

Q3) construct a playfair matrix with the key cryptography. Encrypt this message "Be the change that you wish to see in the world."

CRYPTOGRAPHY

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

Message:
Be the change that you wish to see in the world

BE TH EC HA NG ET HA TY OU WI SH TO SE
GK PB DR BH MA KR BH CP DC XF QB CB MK

SE I NT HE WO RL DX
FK SY GI UA CM IU

GKPBDRBHMAKRBHCPDCXFQBCBMKFUSYGIUACMIU

Q4) Using Playfair matrix shown below

message: The future depends on what you do today

TH EF UT UR ED EP EN DS ON WH AT YO
~~VD OT OD AY~~
DE HM PB PL HT DQ CQ FP AS XT LI XG

VO OT OD AY

PK LM IF OV
DEHMPB PL HTDQCQ FP ASXTLIXGPKLM LFOV

Q5/ ROYAL
NEWZD
BCFGH
IKMPQ
STUVX

Cipher text:

KX JE YU RE BE ZW EN RY TU HE YF

IW TT TU OZ KS YCA JPOB OTEL ZON

XBYB NTQO NEYC UZWR GDSO NSXB

OUYW RYEB . AAHY USEDQ

Decrypted text

LIEUTENANT KENNEDY SAFE NATIVE
KNOWS POSITION. HE CAN PILOT.
ELEVEN ALIVE NEED SMALL BOAT KENNEDY