Roll No: P17-6089
: M. Arslan Ahmad Khan

Q No 1

(i) $27 \bmod 11$

$27 \equiv (9) \bmod 11$

So,

$$11 \overline{)243}\ (22$$
$$242$$
$$1$$

Thus, The Multiplicative Inverse of this is 9.

Additive Inverse:

$27 - 5 \bmod 11$

$$11 \overline{)27}\ (2$$
$$22$$
$$5$$

Thus, the additive Inverse of this is (-5)

(ii) $102 \bmod 4$

$$4 \overline{)102}\ (25$$
$$100$$
$$2$$

There are no Multiplicative Inverse existed of this

Additive Inverse:

$102 - 2 \bmod 4$

$$4 \overline{)100}\ (25$$
$$100$$
$$0$$

Thus, the additive Inverse of this is (-2)

Q#2

a. Decrypt "ZNAUDUSTMPFCVKQNRT" by keyword "Asphalt".

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

Plain Text Pair : ZN AU DU ST MP

~~VU LN ER AB~~ FC VK QN RT

VU LN ER AB IL IT YF OU ND

So,

Decrypted text Cipher =

VULNERABILITY FOUND