Question - 1

$n = 17$

$a = 5$

Private key of Alice = 4

Private key of Bob = 6

→ Public key of Alice : $5^4 \% 7 = 13$

→ Public key of Bob : $5^6 \% 7 = 2$

Now,

→ Secret key obtained by Alice : $2^4 \% 17 = 16$

→ Secret key obtained by Bob : $13^6 \% 17 = 16$

⇒ Value of common secret key = 16.

⇒ **Option (a) → 16**

* Question-02

```
plain_text = "MBATECHDS"
key = "VIVEK"

def generate_key(plain_text, key):
    key = list(key)

    if len(plain_text) == len(key):
        return(key)
    else:
        for i in range(len(plain_text) - len(key)):
            key.append(key[i % len(key)])

    return("".join(key))

def encrypt_cipher(plain_text, key):
    cipher_text = []
    for i in range(len(plain_text)):
        x = ((ord(plain_text[i]) + ord(key[i])) % 26) +
                ord('A')
        cipher_text.append(chr(x))

    return("".join(cipher_text))

key = generate_key(plain_text, key)

ct = encrypt_cipher(plain_text, key)
```

```
print("Plain Text :", plain_text)
print("Keyword :", key)

print("Cipher Text:", ct)
```

```
Plain Text : MBATECHDS
Keyword : VIVEK
Cipher Text: HJVXOXPYW
```