# Bài 1: Đổi các số thập phân sau sang nhị phân:

a) 87 = 64 + 16 + 4 + 2 + 1 => 1010111

b) 111 = 64 + 32 + 8 + 4 + 2 + 1 => 1101111

c) 174 = 128 + 32 + 8 + 4 + 2 => 10101110

d) 221 = 128 + 64 + 16 + 8 + 4 + 1 => 11011101

e) 247 = 128 + 64 + 32 + 16 + 4 + 2 + 1 => 11110111

# Bài 2: Tính địa chỉ đường mạng, khoảng IP khả dụng và địa chỉ broadcast của (Từ các ***Host*** dưới đây) :

**a. 192.168.100.100 / 25**

Đổi 192.168.100.100 thành nhị phân

1100 0000 . 1010 1000 . 0110 0100 . 0110 0100

Đổi 25 bit thành nhị phân

1111 1111 . 1111 1111 . 1111 1111 . 1000 0000

Thực hiện phép AND:

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 |
| 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **1** | **1** | **0** | **0** | **0** | **0** | **0** | **0** | **1** | **0** | **1** | **0** | **1** | **0** | **0** | **0** | **0** | **1** | **1** | **0** | **0** | **1** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** |

Kết quả **địa chỉ đường mạng**: 192.168.100.0

**Địa chỉ Broadcast:**

Vì Subnet mark là 25 => đổi tất các bit sau bit 25 thành 1

192.168.01100100.01100100 =>192.168.01100100.01111111

Đổi thành thập phân là: **192.168.100.127**

**Khoảng IP khả dụng** là từ 192.168.100.101 đến 192.168.100.126

**b. 192.111.121.20 / 26**

Đổi 192.111.121.20 thành nhị phân

1100 0000 . 0110 1111 .

Đổi 26 bit thành nhị phân

1111 1111 . 1111 1111 . 1111 1111 . 0000 0010

Thực hiện phép AND:

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 |
| 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| **1** | **1** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **1** | **1** | **0** | **1** | **1** | **1** | **1** | **0** | **1** | **1** | **1** | **1** | **0** | **0** | **1** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** |

Kết quả Địa chỉ đường mạng: 192.111.121.0

Vậy địa chỉ mạng thuộc lớp C

Khoảng IP khả dụng là từ 192.111.121.2 đến 192.111.121.254

Địa chỉ Broadcast: 192.111.121.255

**c. 172.134.167.1 / 18**

Đổi 172.134.167.1 thành nhị phân

Đổi 18 bit thành nhị phân

1111 1111 . 1111 1111 . 1100 0000 . 0000 0000

Thực hiện phép AND:

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| **1** | **0** | **1** | **0** | **1** | **1** | **0** | **0** | **1** | **0** | **0** | **0** | **0** | **1** | **1** | **0** | **1** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** |

Kết quả Địa chỉ đường mạng: 172.134.128.0

Vậy địa chỉ mạng thuộc lớp B

Khoảng IP khả dụng là từ 172.134.128.2 đến 172.134.128.254

Địa chỉ Broadcast: 172.134.128.255

**d. 172.224.248.1 / 20**

Đổi 172.224.248.1 thành nhị phân

Đổi 20 bit thành nhị phân

1111 1111 . 1111 1111 . 1111 0000 . 0000 0000

Thực hiện phép AND:

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| **1** | **0** | **1** | **0** | **1** | **1** | **0** | **0** | **1** | **0** | **0** | **0** | **0** | **1** | **1** | **0** | **1** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** |

Kết quả Địa chỉ đường mạng: 172.134.128.0

Khoảng IP khả dụng là từ 172.134.128.2 đến 172.134.128.254

Địa chỉ Broadcast: 172.134.128.255

**e. 10.110.120.1 / 10**

Đổi 10.110.120.1 thành nhị phân

Đổi 10 bit thành nhị phân

1111 1111 . 1111 1111 . 1100 0000 . 0000 0000

Thực hiện phép AND:

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| **1** | **0** | **1** | **0** | **1** | **1** | **0** | **0** | **1** | **0** | **0** | **0** | **0** | **1** | **1** | **0** | **1** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** |

Kết quả Địa chỉ đường mạng: 172.134.128.0

Khoảng IP khả dụng là từ 172.134.128.2 đến 172.134.128.254

Địa chỉ Broadcast: 172.134.128.255

**f. 10.127.64.1 / 12**

Đổi **10.127.64.1** thành nhị phân

Đổi 12 bit thành nhị phân

1111 1111 . 1111 1111 . 1100 0000 . 0000 0000

Thực hiện phép AND:

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| **1** | **0** | **1** | **0** | **1** | **1** | **0** | **0** | **1** | **0** | **0** | **0** | **0** | **1** | **1** | **0** | **1** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** |

Kết quả Địa chỉ đường mạng: 172.134.128.0

Khoảng IP khả dụng là từ 172.134.128.2 đến 172.134.128.254

Địa chỉ Broadcast: 172.134.128.255