Q2

IP : 192.16.10.22   255.255.255.252

Valid hosts range?

252 →	1	1	1	1	1	1	0	0
22 →	0	0	0	1	0	1	1	0

20 →	0	0	0	1	0	1	0	0
23 →	0	0	0	1	0	1	1	1

network ID = 192.16.10.20

broadcast ID = 192.16.10.23

so,

host range = 192.16.10.21 — 192.16.10.22

Q3

192.168.246.189/29

32 - 29 = 3

248 → 1 1 1 1 1 | 0 0 0

189 → 1 0 1 1 1 | 1 0 1

184 → 1 0 1 1 1 | 0 0 0

so,

network ID = 192.168.248.184

| Q4 |

(1)   12.5.6.111/26

Subnet = 255.255.255.192

```
11 . 0  0  0  0  0    0          →192
10 . 0  1  0  0  0    1          →111
_____
10 . 0  0  0  0  0    0          →128
10 . 1  1  1  1  1    1          →191
```

network ID = 12.5.6.128
Broadcast = 12.5.6.191

(ii) 100.20.200.200/25

Subnet = 255.255.255.128

1 0 0 0 0 0 0 0   → 128
1 1 0 0 1 0 0 0   → 200
_____

1 0 0 0 0 0 0 0   → 128
1 1 1 1 1 1 1 1   → 255

Network ID = 100.20.200.128
Broadcast = 100.20.200.255

(iii) 216.0.0.189/30

255.255.255.252

| 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | → 252 |
| 1 | 0 | 1 | 1 | 1 | 1 | 0 | 1 | → 189 |

| 1 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | → 188 |
| 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | → 191 |

Network ID = 216.0.0.188
Broadcast = 216.0.0.191

(iv) 172.18.5.150/28

255.255.255.240

| 1 | 1 | 1 | 1 | , | 0 | 0 | 0 | 0 | → 240 |
| 1 | 0 | 0 | 1 | , | 0 | 1 | 1 | 0 | → 150 |

| 1 | 0 | 0 | 1 | , | 0 | 0 | 0 | 0 | → 144 |
| 1 | 0 | 0 | 1 | , | 1 | 1 | 1 | 1 | → 159 |

Network ID = 172.18.5.144
Broadcast = 172.18.5.159