**Worksheet 18(a) - IP Addressing - Classful**

1. List the subnet mask for each class A, B, C:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Class** | **# of bits - NW part** | **# of bits - Host part** | **Subnet mask** | **Starting bit or bits** |
| A |  |  |  |  |
| B |  |  |  |  |
| C |  |  |  |  |

1. For the following IP addresses, find the net mask and net number and the class that they belong to:

|  |  |  |  |
| --- | --- | --- | --- |
| **IP Address** | **Subnet mask** | **Network address** | **Class** |
| 192.168.25.85 |  |  |  |
| 172.16.5.35 |  |  |  |
| 10.55.33.11 |  |  |  |
| 128.96.33.81 |  |  |  |

1. For the following IP addresses, find the subnet number and the class that they belong to:

**Network address = IP Address & Subnet mask**

|  |  |  |  |
| --- | --- | --- | --- |
| **IP Address** | **Subnet mask** | **Network address** | **Class** |
| 192.168.25.85 | 255.255.255.192 |  |  |
| 172.16.5.35 | 255.255.224.0 |  |  |
| 10.55.33.11 | 255.240.0.0 |  |  |
| 192.168.8.32 | 255.255.255.240 |  |  |
| 10.132.4.24 | 255.255.192.0 |  |  |
| 128.96.100.54 | 255.255.255.128 |  |  |
| 172.55.84.103 | 255.255.252.0 |  |  |
| 128.111.92.145 | 255.255.240.0 |  |  |

1. For the following IP addresses, from question 2 above, calculate the following:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **IP Address** | **Subnet mask** | **Class** | **# of NW bits** | **# SN bits** | **# of subnets** | **# of hosts in each SN** |
| 192.168.25.85 | 255.255.255.192 |  |  |  |  |  |
| 172.16.5.35 | 255.255.224.0 |  |  |  |  |  |
| 10.55.33.11 | 255.240.0.0 |  |  |  |  |  |
| 192.168.8.32 | 255.255.255.240 |  |  |  |  |  |
| 10.132.4.24 | 255.255.192.0 |  |  |  |  |  |
| 128.96.100.54 | 255.255.255.128 |  |  |  |  |  |
| 172.55.84.103 | 255.255.252.0 |  |  |  |  |  |
| 128.111.92.145 | 255.255.240.0 |  |  |  |  |  |

1. Consider the following routing table:

|  |  |  |
| --- | --- | --- |
| **Network address** | **Subnet Mask** | **Next Hop** |
| 128.96.39.0 | 255.255.255.128 | I0 |
| 128.96.39.128 | 255.255.255.128 | I1 |
| 128.96.40.0 | 255.255.255.128 | R2 |
| 192.4.153.0 | 255.255.255.192 | R3 |
| default |  | R4 |

What is the next hop for packets that arrive with the following destinations:

1. 128.96.39.10
2. 128.96.40.12
3. 128.96.40.151
4. 192.4.153.17
5. 192.4.153.90
6. Consider the following routing table:

|  |  |  |
| --- | --- | --- |
| **Network address** | **Subnet Mask** | **Next Hop** |
| 128.39.0.0 | 255.255.128.0 | I0 |
| 128.39.128.0 | 255.255.128.0 | I1 |
| 128.40.0.0 | 255.255.128.0 | R2 |
| 192.4.0.0 | 255.255.128.0 | R3 |
| 192.4.128.0 | 255.255.192.0 | R4 |
| default |  | R5 |

If **IP address & Subnet mask == Network address**, then send packet to corresponding **next hop**

What is the next hop for packets that arrive with the following destination **IP Addresses**:

1. 128.39.96.10
2. 128.40.53.12
3. 128.40.151.96
4. 192.4.150.17
5. 192.4.132.90