IP Addressing Exercises Solution

Exercise 1. Using the IP address and netmask shown write out the network address in CIDR format:

IP Address	Netmask	Network Address
188.10.18.2	255.255.0.0	
223.69.230.250	255.255.240.0	
192.149.24.191	255.224.0.0	
150.203.23.19	255.128.0.0	

Solution:

IP Address	Netmask	Network Address
188.10.18.2	255.255.0.0	188.10.0.0 /16
223.69.230.250	255.255.240.0	223.69.224.0 /20
192.149.24.191	255.224.0.0	192.128.0.0 /11
150.203.23.19	255.128.0.0	150.128.0.0 /9

Exercise 2. Using the IP address and netmask shown write out the network address in CIDR format:

IP Address	Netmask	Network Address
222.49.49.11	255.255.255.0	
128.23.230.19	255.255.240.0	
117.15.2.51	255.224.0.0	
48.21.25.54	255.128.0.0	

Solution:

IP Address	Netmask	Network Address
222.49.49.11	255.255.255.0	222.49.49.0 /24
128.23.230.19	255.255.240.0	128.23.224.0 /20
117.15.2.51	255.224.0.0	117.0.0.0 /11
48.21.25.54	255.128.0.0	48.0.0.0 /9

Exercise 3. Given the address 192.168.10.19/28, which of the following are valid host addresses on this net?

A. 192.168.10.29
B. 192.168.10.16
C. 192.168.10.17
D. 192.168.10.31
E. 192.168.10.0

Solution:

Net. ID Hots ID
192.168.10.19/28 ------> 192.168.10. 00010011

Valid Host Addresses: 192.168.10.17 to 192.168.10.29
Broadcast Address: 192.168.10.31
Network Address: 192.168.10.16 /28
E. 192.168.10.0 out of range (it doesn't belong to 192.168.10.16/28 network)

Exercise 4. Which of the following IP addresses fall into the CIDR block of 115.64.4.0/22?

A. 115.64.8.32
B. 115.64.7.64
C. 115.64.6.255
D. 115.64.3.255
E. 115.64.5.128
F. 115.64.12.128

Solution:

Net. ID Hots ID
115.64.4.0/22 ------> 115.64. 00000100. 00000000
Valid Host Addresses: 115.64.4.1 to 115.64.7.254
Broadcast Address: 115.64.7.255
Network Address: 115.64.4.0 /22

A. 115.64.8.32 out of range (it doesn't belong to 115.64.4.0 /22)
B. 115.64.7.64 valid host address
C. 115.64.6.255 valid host address
D. 115.64.3.255 out of range (it doesn't belong to 115.64.4.0 /22)
E. 115.64.5.128 valid host address
F. 115.64.12.128 out of range (it doesn't belong to 115.64.4.0 /22)

Exercise 5. What are the network address, broadcast address, and the netmask for a host with the IP Address below?

IP Address:	**218**	**3**	**90**	**32**	**/ 21**
Network Address:					
Broadcast Address:					
Netmask:					

Solution:

IP Address:	**218**	**3**	**90**	**32**	**/ 21**
Network Address:	218	3	88	0	/21
Broadcast Address:	218	3	95	255	
Netmask:	255	255	248	0	

IP Address:	**217**	**192**	**121**	**26**	**/ 30**
Network Address:					
Broadcast Address:					
Subnet Mask:					

Solution:

IP Address:	**217**	**192**	**121**	**26**	**/ 30**
Network Address:	217	192	121	24	/30
Broadcast Address:	217	192	121	27	
Subnet Mask:	255	255	255	252	

IP Address:	102	233	54	136	/ 23
Network Address:					
Broadcast Address:					
Subnet Mask:					

Solution:

IP Address:	102	233	54	136	/ 23
Network Address:	102	233	54	0	/23
Broadcast Address:	102	233	55	255	
Subnet Mask:	255	255	254	0	

IP Address:	214	180	46	20	/ 29
Network Address:					
Broadcast Address:					
Subnet Mask:					

Solution:

IP Address:	214	180	46	20	/ 29
Network Address:	214	180	46	16	/29
Broadcast Address:	214	180	46	23	
Subnet Mask:	255	255	255	248	

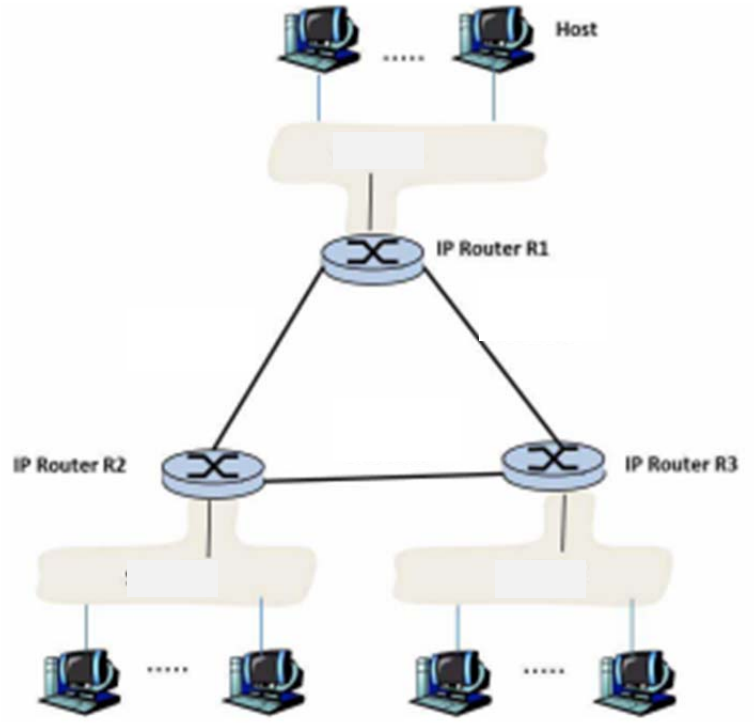
Exercise 6. Are the following IP addresses valid? If so, indicate the type of address (host, network, special, or private address).

IP address	Type of address
192.1.1.128/25	
158.42.181.255/23	
10.0.0.7/30	
192.168.1.0/24	
192.168.1.128/24	
192.168.1.128/25	
85.25.135.45/16	
158.42.256.181/16	
224.1.2.3/4	
80.200.40.4/30	
80.200.40.5/30	
80.200.40.6/30	
80.200.40.7/30	

Solution:

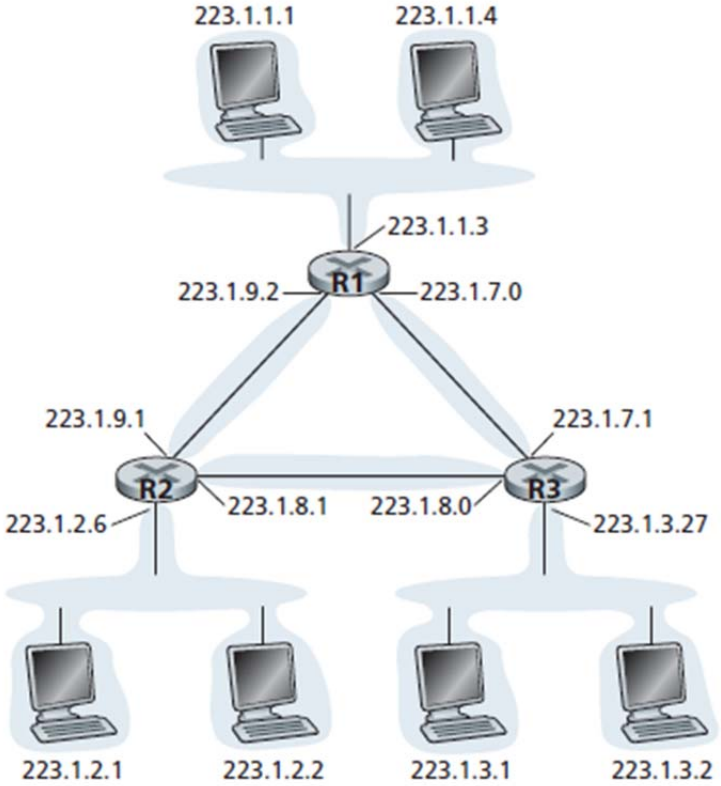
IP address	Type of address
192.1.1.128/25	**Network Address**
158.42.181.255/23	**Broadcast Address of 158.42.180.0/23 network**
10.0.0.7/30	**Broadcast Address of 10.0.0.4/30 Private Network**
192.168.1.0/24	**Private Network Address**
192.168.1.128/24	**Private Host Address**
192.168.1.128/25	**Private Network Address**
85.25.135.45/16	**Host Address**
158.42.256.181/16	**Invalid Address (1byte->max. 255)**
224.1.2.3/4	**Multicast Address**
80.200.40.4/30	**Network Address**
80.200.40.5/30	**Host Address**
80.200.40.6/30	**Host Address**
80.200.40.7/30	**Broadcast Address**

Exercise 7.



Consider the network shown above. Our task is to assign addresses to all interfaces. All addresses must be allocated from the network addresses 223.1.1.0/24 to 223.1.9.0/24.

Solution:


223.1.1.1
223.1.1.4
223.1.1.3
R1
223.1.9.2
223.1.7.0
223.1.9.1
223.1.7.1
R2
R3
223.1.8.1
223.1.8.0
223.1.2.6
223.1.3.27
223.1.2.1
223.1.2.2
223.1.3.1
223.1.3.2