Classful IP Addressing - **Practice Exercises**

1. Complete the following table which provides practice in converting a number from binary notation to decimal format.

Binary	128	64	32	16	8	4	2	1	Decimal
11001100	1	1	0	0	1	1	0	0	128+64+8+4 = 204
10101010									
11100011									
10110011									
00110101									

2. Complete the following table which provides practice in converting a number from decimal notation to binary format.

Decimal	128	64	32	16	8	4	2	1	Binary
48	0	0	1	1	0	0	0	0	$48=32+16=00110000_2$
222									
119									
135									
60									

3. Express 145.32.59.24 in binary format and identify the address class:

_____

4. Express 200.42.129.16 in binary format and identify the address class:

_____

5. Express 14.82.19.54 in binary format and identify the address class:

_____

Subnetting Exercise #1

Assume that you have been assigned the 132.45.0.0/16 network block. You need to establish 8 subnets.

1. _____ binary digits are required to define eight subnets.

2. Specify the extended-network-prefix that allows the creation of 8 subnets.
_____

3. Express the subnets in binary format and dotted decimal notation:
#0 _____
#1 _____
#2 _____
#3 _____
#4 _____
#5 _____
#6 _____
#7 _____

4. List the range of host addresses that can be assigned to Subnet #3 (132.45.96.0/19).
_____
_____
_____
_____
_____

5. What is the broadcast address for Subnet #3 (132.45.96.0/19) ?
_____

Subnetting Exercise #2

1. Assume that you have been assigned the 200.35.1.0/24 network block. Define an extended-network-prefix that allows the creation of 20 hosts on each subnet.

_____

2. What is the maximum number of hosts that can be assigned to each subnet?

_____

3. What is the maximum number of subnets that can be defined?

_____

4. Specify the subnets of 200.35.1.0/24 in binary format and dotted decimal notation.

_____
_____
_____
_____
_____
_____
_____
_____
_____

5. List range of host addresses that can be assigned to Subnet #6 (200.35.1.192/27)

_____
_____
_____
_____
_____
_____
_____
_____
_____
_____

6. What is the direct broadcast address for subnet 200.35.1.192/27?

_____

VLSM Exercise

An organization has been assigned the network number 140.25.0.0/16 and it plans to deploy VLSM. The following Figure provides a graphic display of the VLSM design for the organization.
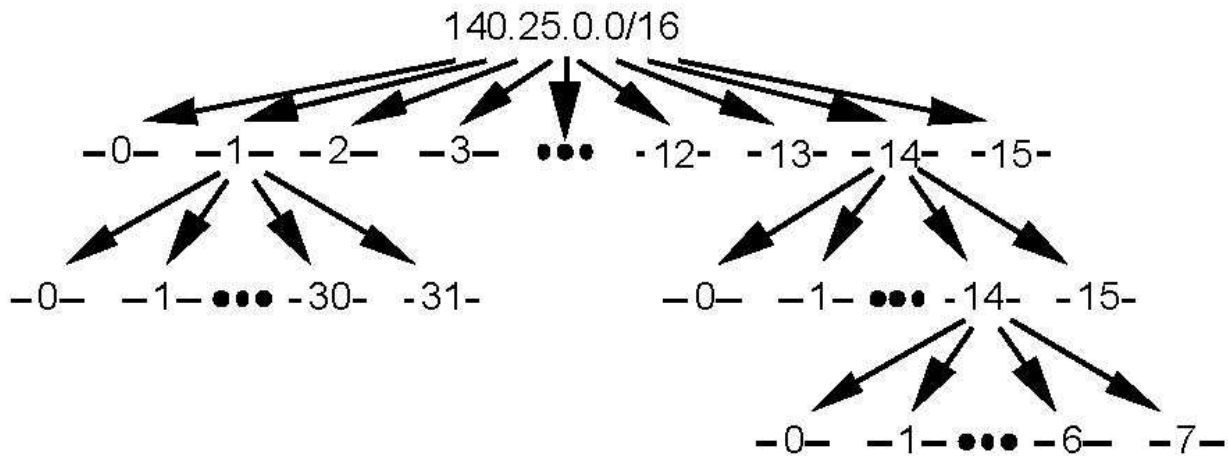
140.25.0.0/16

−0− −1− −2− −3− ••• −12− −13− −14− −15−

−0− −1− ••• −30− −31−   −0− −1− ••• −14− −15−

−0− −1− ••• −6− −7−

Figure: Address Strategy for VLSM Example

To arrive at this design, the first step of the subnetting process divides the base network address into 8 equal-sized address blocks. Then Subnet #1 is divided it into 32 equal-sized address blocks and Subnet #6 is divided into 16 equal-sized address blocks.
Finally, Subnet #6-14 is divided into 8 equal-sized address blocks.

1. Specify the eight subnets of 140.25.0.0/16:
#0 _____
#1 _____
#2 _____
#3 _____
#4 _____
#5 _____
#6 _____
#7 _____

2. List the host addresses that can be assigned to Subnet #3 (140.25.96.0):
_____
_____
_____
_____
_____
_____

3. Identify the broadcast address for Subnet #3 (140.25.96.0):
_____

4. Specify the 16 subnets of Subnet #6 (140.25.192.0/19):
#6-0_____
#6-1_____
#6-2_____
#6-3_____
#6-4_____
#6-5_____
#6-6_____
#6-7_____
#6-8_____
#6-9_____
#6-10_____
#6-11_____
#6-12_____
#6-13_____
#6-14_____
#6-15_____

5. List the host addresses that can be assigned to Subnet #6-3 (140.25.198.0/23):
_____
_____
_____
_____
_____
_____

6. Identify the broadcast address for Subnet #6-3 (140.25.198.0/23):
_____

7. Specify the eight subnets of Subnet #6-14 (140.25.220.0/23):
#6-14-0 _____
#6-14-1 _____
#6-14-2 _____
#6-14-3 _____
#6-14-4 _____
#6-14-5 _____
#6-14-6 _____
#6-14-7 _____

8. List the host addresses that can be assigned to Subnet #6-14-2 (140.25.220.128/26):
_____
_____
_____
_____
_____
_____

9. Identify the broadcast address for Subnet #6-14-2 (140.25.220.128/26):
_____