Custom Subnet Masks

Problem 4

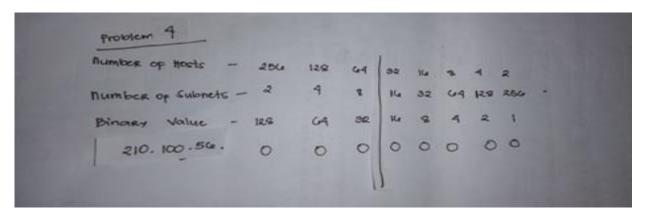|	
Number of needed subnets	6
Number of needed usable hosts	30
Network Address	195.85.8.0
Address class	C
Default subnet mask	255 . 255 . 255 . 0
Custom subnet mask	255 . 255 . 255 . 224
Total number of subnets	8
Total number of host addresses	32
Number of usable addresses	30
Number of bits borrowed	3

Show your work for Problem 4 in the space below.

128	**32**	**host**
64	**-2**	
32	**30**	**Unstable host**
224	**Custom Subnet mask**	

Custom Subnet Masks

Problem 5

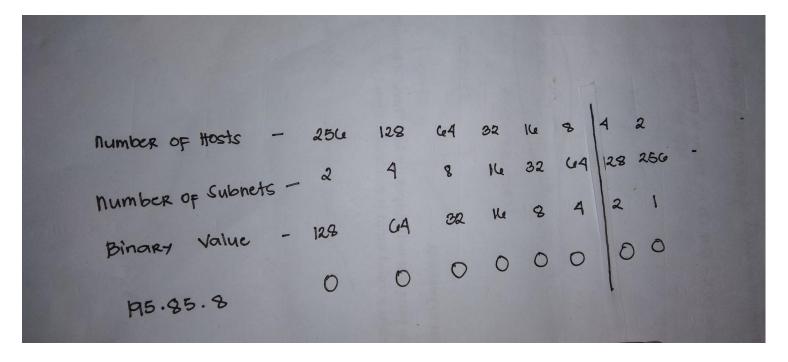|	
Number of needed subnets	<u>6</u>
Number of needed usable hosts	<u>30</u>
Network Address	<u>210.100.56.0</u>
Address class	<u>C</u>
Default subnet mask	<u>255 . 255 . 255 . 0</u>
Custom subnet mask	<u>255 . 255 . 255 . 224</u>
Total number of subnets	<u>8</u>
Total number of host addresses	<u>32</u>
Number of usable addresses	<u>30</u>
Number of bits borrowed	<u>2</u>

Show your work for Problem 5 in the space below.

number of Hosts — 256   128   64   32   16   8   4   2

number of Subnets — 2   4   8   16   32   64   128   256

Binary Value — 128   64   32   16   8   4   2   1

      0   0   0   0   0   0   0   0

A5.85.8

128	32 host
64	-2
+32	30 usable host
224 Custom Subnet mask	

Custom Subnet mask

Problem 6

Number of needed subnets	**126**
Number of needed usable hosts	**131,070**
Network Address	**118.0.0.0**
Address class	**A**
Default subnet mask	**255.0.0.0**
Custom subnet mask	**255.255.255.255**
Total number of subnets	**128**
Number of usable subnets	**126**
Total number of host addresses	**131072**
Number of usable addresses	**131070**
Number of bits borrowed	**7**

Show your work for Problem 6 in the space below.

128+64+32+16+8+4+2= **254 Subnet mask**   131172-2=131070 **usable addresses**

128-2=126 **usable subnets**

Custom Subnet Masks

Problem 7

Number of needed subnets	**2000**
Number of needed usable hosts	**15**
Network Address	**178.100.0.0**
Address class	**B**
Default subnet mask	**255.255.0.0**
Custom subnet mask	**255.255.255.224**
Total number of subnets	**2048**
Number of usable subnets	**2046**
Total number of host addresses	**32**
Number of usable addresses	**30**
Number of bits borrowed	**11**

Show your work for Problem 7 in the space below.

128+64+32+16+8+4+2+1=255 **Custom subnet mask**

2048-2=2046   **usable subnets**

32-2=30   **usable addresses**

Custom Subnet Masks

Problem 8

Number of needed subnets	**3**
Number of needed usable hosts	**45**
Network Address	**200.175.14.0**
Address class	**C**
Default subnet mask	**255.255.255.0**
Custom subnet mask	**255.255.255.192**
Total number of subnets	**4**
Number of usable subnets	**2**
Total number of host addresses	**64**
Number of usable addresses	**62**
Number of bits borrowed	**2**

Show your work for Problem 8 in the space below.

Number of Hosts	—	256	128	64	32	16	8	4	2
Number of Subnets	—	2	4	8	16	32	64	128	256
Binary Value	—	128	64	32	16	8	4	2	1

200 . 175 . 14 . O   O | O O O O O O

128+64= 192	**Number of usable subnets**
4-2=2	**usable subnets**
64-2=62	**usable addresses**

Custom Subnet Masks

Problem 9

Number of needed subnets	<u>60</u>
Number of needed usable hosts	<u>1,000</u>
Network Address	<u>128.77.0.0</u>
Address class	<u>B</u>
Default subnet mask	<u>255.255.0.0</u>
Custom subnet mask	<u>255.255.252.0</u>
Total number of subnets	<u>64</u>
Number of usable subnets	<u>62</u>
Total number of host addresses	<u>1024</u>
Number of usable addresses	<u>1022</u>
Number of bits borrowed	<u>6</u>

Show your work for Problem 9 in the space below.

128+64+32+16+8+4= 252   Custom subnet mask

64-2=62   usable subnets

1024-2=1022   usable addresses

Custom Subnet Masks

Problem 10

Number of needed subnets	**60**
Number of needed usable hosts	**198.100.10.0**
Address class	**C**
Default subnet mask	**255.255.255.0**
Custom subnet mask	**255.255.255.192**
Total number of subnets	**4**
Number of usable subnets	**2**
Total number of host addresses	**64**
Number of usable addresses	**62**
Number of bits borrowed	**2**

Show your work for Problem 10 in the space below.

Problem 10

Number of Hosts	—	256	128	64	32	16	8	4	2	
Number of Subnets	—	2	4	8	16	32	64	128	256	—
Binary Value	—	128	64	32	16	8	4	2	1	
198.100.10		O	O	O	O	O	O	O	O	

128+64= 192   Custom subnet mask

4-2=2   usable subnets

64-2=62   usable addresses

Custom Subnet Masks

Problem 11

Number of needed subnets	**250**
Number of needed usable hosts	**101.0.0.0**
Address class	**A**
Default subnet mask	**255.0.0.0**
Custom subnet mask	**255.255.0.0**
Total number of subnets	**256**
Number of usable subnets	**254**
Total number of host addresses	**65 356**
Number of usable addresses	**65 354**
Number of bits borrowed	**8**

Show your work for Problem 11 in the space below.

128+64+32+16+8+4+2+1=255   Custom subnet mask

256 -2 =254   usable subnets

65,536 -2 =65,534   usable addresses

Custom Subnet Masks

Problem 12

Number of needed usable subnets	<u>5</u>
Network Address	**<u>218.35.50.</u>**
Address class	**<u>C</u>**
Default subnet mask	**<u>255 . 255 . 255 . 0</u>**
Custom subnet mask	**<u>255 . 255 . 255 . 224</u>**
Total number of subnets	**<u>8</u>**
Number of usable subnets	**<u>6</u>**
Total number of host	**<u>32</u>**
Addresses Number of usable addresses	**<u>30</u>**
Number of bits borrowed	**<u>3</u>**

Show your work for Problem 12 in the space below.

Problem 12

Number of Hosts	—	256	128	64	32	16	8	4	2
Number of Subnets	—	2	4	8	16	32	64	128	256
Binary Value	—	128	64	32	16	8	4	2	1
218.35.50		O	O	O	O	O	O	O	O

128 64 +32 =224   **Custom subnet mask**

64 -2 =62

4 -2 =2

Custom Subnet Masks

Problem 13

Number of needed subnets	**25**
Number of needed usable hosts	**218.35.50.0**
Address class	**C**
Default subnet mask	**255 . 255 . 255 . 0**
Custom subnet mask	**255 . 255 . 255 . 254**
Total number of subnets	**8**
Number of usable subnets	**6**
Total number of host addresses	**32**
Number of usable addresses	**30**
Number of bits borrowed	**3**

Show your work for Problem 13 in the space below.

128 64 +32 =224 Custom subnet mask   **32 -2 =30 Number of usable addresses**

8 -2 =6 Number of usable subnets

Custom Subnet Masks

Problem 14

Number of needed subnets	**10**
Number of needed usable hosts	172.59.0.0
Address class	**B**
Default subnet mask	**255 . 255 . 0 . 0**
Custom subnet mask	**255 . 255 . 240 . 0**
Total number of subnets	**16**
Number of usable subnets	**14**
Total number of host addresses	**4,096**
Number of usable addresses	**4,094**
Number of bits borrowed	**4**

Show your work for Problem 14 in the space below.

128+ 64+ 32 +16= 240	**Custom subnet mask**
16 -2 =14	**usable subnets**
4,096 -2 =4,094	**usable addresses**

Custom Subnet Masks

Problem 15

Number of needed subnets	**50**
Number of needed usable hosts	**172.59.0.0**
Address class	**B**
Default subnet mask	**255 . 255 . 0 . 0**
Custom subnet mask	**255 . 255 . 255 . 192**
Total number of subnets	**1,024**
Number of usable subnets	**1,022**
Total number of host addresses	**64**
Number of usable addresses	**62**
Number of bits borrowed	**10**

Show your work for Problem 15 in the space below.

178.59.   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0

128+ 64+ 32+ 16+ 8+ 4+ 2 +1= 255   Custom subnet mask

128 +64 =192

64 -2= 62   usable addresses

1,024 -2 =1,022 usable subnets

Custom Subnet Masks

Problem 16

Number of needed subnets	**29**
Number of needed usable hosts	**23.0.0.0**
Address class	**A**
Default subnet mask	**255 . 0 . 0 . 0**
Custom subnet mask	**255 . 255 . 255 . 254**
Total number of subnets	524,288
Number of usable subnets	**524,286**
Total number of host addresses	**32**
Number of usable addresses	**30**
Number of bits borrowed	**19**

Show your work for Problem 16 in the space below.

128 +64 +32= 224   Custom subnet mask

32 -2 =30   usable addresses

524,288 -2 =524,286   usable subnets

Subnetting

Problem 3

Number of needed usable hosts	**1**
Number of needed usable hosts	**195.223.50.0**
Network Address Address class	**C**
Default subnet mask	**255.255.255.0**
Custom subnet mask	**255.255.255.192**
Total number of subnets	**4**
Number of usable subnets	**2**
Total number of host	**64**
Addresses Number of usable addresses	**62**
Number of bits borrowed	**2**
What is the 3rd usable subnet range?	**190.35.3.128 to 190.35.3.191**
What is the subnet number for the 7th usable subnet?	**195.223.50.64**
What is the subnet broadcast address for the 12th usable subnet?	**190.35.2.127**
What are the assignable addresses for the 8th usable subnet?	**195.223.50.129 - 195.223.50.190**

Show your work for Problem 3 in the space below.

Subnetting

Problem 4

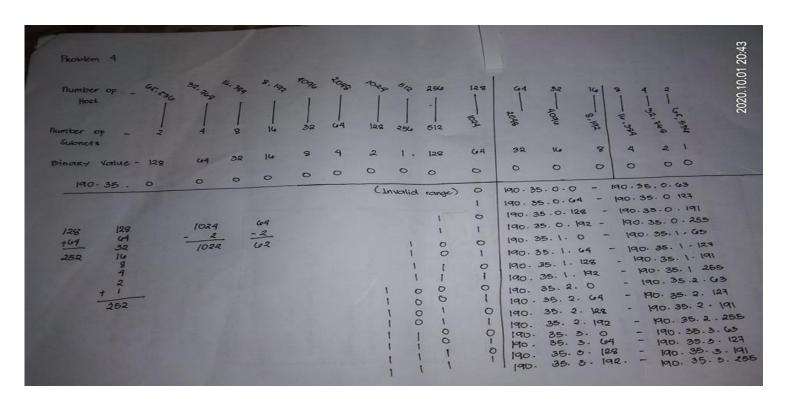|	
Number of needed usable hosts	**750**
Number of needed usable hosts	**190.35.0.0**
Network Address Address class	**B**
Default subnet mask	**255.255.255.0**
Custom subnet mask	**255.255.255.192**
Total number of subnets	**1024**
Number of usable subnets	**1022**
Total number of host	64
addresses Number of usable addresses	**62**
Number of bits borrowed	**10**
What is the 14th usable subnet range?	**195.223.50.128 - 195.223.50.191**
What is the subnet number for the 12th usable subnet?	**190.35.3.0**
What is the subnet broadcast address for the 9th usable subnet?	**190.35.2.127**
What are the assignable addresses for the 5th usable subnet?	**190.35.1.65 to 190.35.1.126**

Show your work for Problem 4 in the space below.

Subnetting

Problem 5

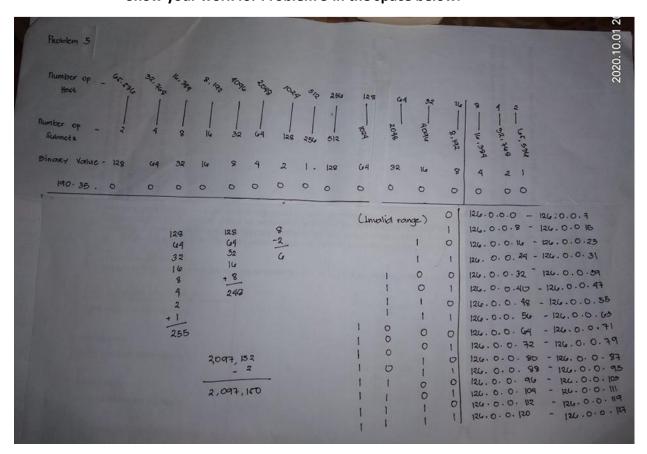|	
Number of needed usable hosts	<u>6</u>
Number of needed usable hosts	<u>**126.0.0.0**</u>
Network Address class	<u>A</u>
Default subnet mask	<u>**255.0.0.0**</u>
Custom subnet mask	<u>**255.255.255.248**</u>
Total number of subnets	<u>**2,097,152**</u>
Number of usable subnets	<u>**2,097,150**</u>
Total number of host	<u>8</u>
Addresses Number of usable addresses	<u>6</u>
Number of bits borrowed	<u>21</u>
What is the 4th usable subnet range?	<u>**126.0.0.8 to 126.0.0.15**</u>
What is the subnet number for the 12th usable subnet?	<u>**126.0.0.32**</u>
What is the subnet broadcast address for the 9th usable subnet?	<u>**126.0.0.55**</u>
What are the assignable addresses for the 5th usable subnet?	<u>**126.0.0.73 to 126.0.0.78**</u>

Show your work for Problem 5 in the space below.
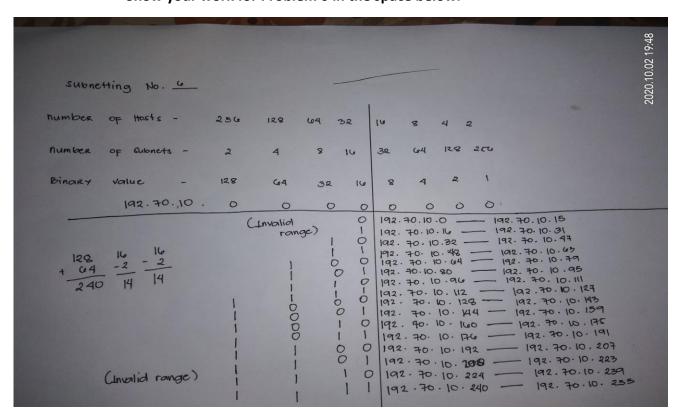
Subnetting

Problem 6

Number of host needed	**10**
Number of needed usable hosts	**192.70.0.0**
Network Address Address cla ss	**C**
Default subnet mask	**255.255.255.0**
Custom subnet mask	**255.255.255.240**
Total number of subnets	**16**
Number of usable subnets	**14**
Total number of host	**16**
addresses Number of usable addresses	**14**
Number of bits borrowed	**4**
What is the 8th usable subnet range?	**192.70.10.128 to 192.70.10.143**
What is the subnet number for the 3rd usable subnet?	**192.70.10.48**
What is the subnet broadcast address for the 11th usable subnet?	**192.70.10.191**
What are the assignable addresses for the 9th usable subnet?	**192.70.10.145 to 192.70.10.158**

Show your work for Problem 6 in the space below.

Subnetting

Problem 7

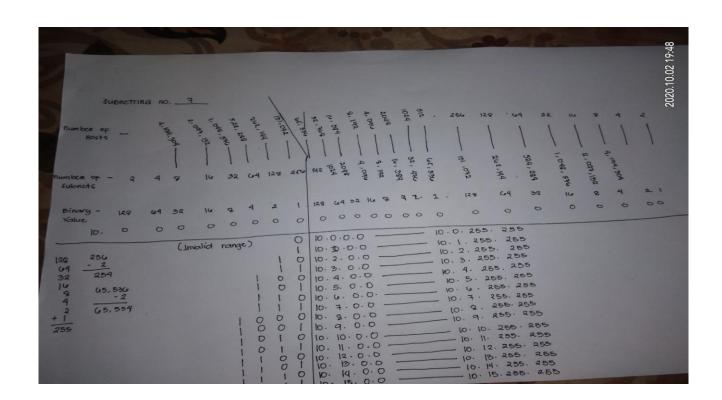|	
Number of needed usable hosts	**10.0.0.0 /16**
Network Address Address class	<u>A</u>
Default subnet mask	**255.0.0.0**
Custom subnet mask	**255.255.0.0**
Total number of subnets	**256**
Number of usable subnets	**254**
Total number of host addresses	**65,536**
Number of usable addresses	**65,534**
Number of bits borrowed	**8**
What is the 10th usable subnet range?	**10.10.0.0 to 10.10.255.255**
What is the subnet number for the 5th usable subnet?	**10.5.0.0**
What is the subnet broadcast address for the 1st usable subnet?	**10.1.255.255**
What are the assignable addresses for the 8th usable subnet?	**10.8.0.1 to 10.8.255.254**

Show your work for Problem 7 in the space below.

Subnetting

Problem 8

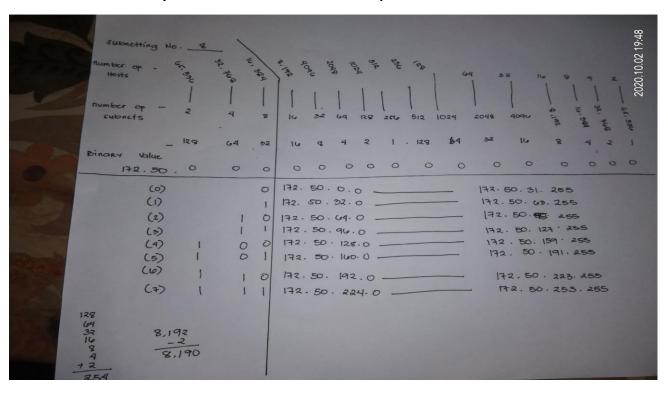|	
Number of needed usable hosts	**5**
Number of needed usable hosts	172.50.0.0
Network Address Address class	**B**
Default subnet mask	**255.255.0.0**
Custom subnet mask	**255.255.224.0**
Total number of subnets	**8**
Number of usable subnets	**6**
Total number of host	**8,192**
addresses Number of usable addresses	**8,190**
Number of bits borrowed	**3**
What is the 3rd usable subnet range?	**172.50.96.0 to 172.50.127.255**
What is the subnet number for the 4th usable subnet?	**172.50.128.0**
What is the subnet broadcast address for the 5th usable subnet?	**172.50.191.255**
What are the assignable addresses for the 2nd usable subnet?	**172.50.64.1 to 172.50.95.254**

Show your work for Problem 8 in the space below.

Subnetting

Problem 9

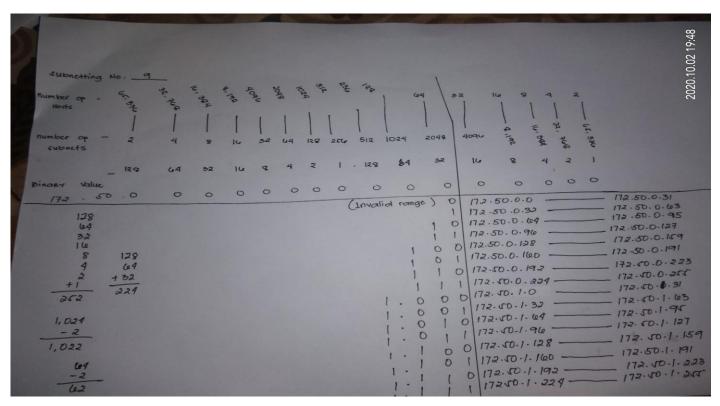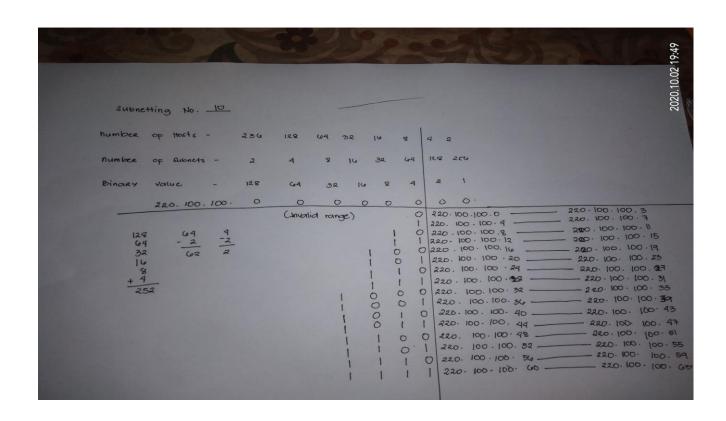|	
Number of needed usable hosts	28
Network Address	**172.50.0.0**
Address class	**B**
Default subnet mask	**255.255.0.0**
Custom subnet mask	**255.255.255.224**
Total number of subnets	**2048**
Number of usable subnets	**2046**
Total number of host addresses	**32**
Number of usable addresses	**30**
Number of bits borrowed	**11**
What is the 1st usable subnet range?	**172.50.0.32 to 172.50.0.63**
What is the subnet number for the 9th usable subnet?	**172.50.1.32**
What is the subnet broadcast address for the 3rd usable subnet?	**172.50.0.127**
What are the assignable addresses for the 5th usable subnet?	**172.50.0.161 to 172.50.0.190**

Show your work for Problem 9 in the space below.

Subnetting

Problem 10

Number of needed usable hosts	45
Network Address	**220.100.100.0**
Address class	<u>C</u>
Default subnet mask	**255.255.255.0**
Custom subnet mask	**255.255.255.252**
Total number of subnets	<u>64</u>
Number of usable subnets	<u>62</u>
Total number of host addresses	<u>4</u>
Number of usable addresses	<u>2</u>
Number of bits borrowed	<u>6</u>
What is the 4th usable subnet range?	**220.100.100.16 to 220.100.100.19**
What is the subnet number for the 3rd usable subnet?	**220.100.100.12**
What is the subnet broadcast address for the 21th usable subnet?	**220.100.100.51**
What are the assignable addresses for the 11th usable subnet?	**220.100.100.45 to 220.100.100.46**

Show your work for Problem 10 in the space below.

Problem 11

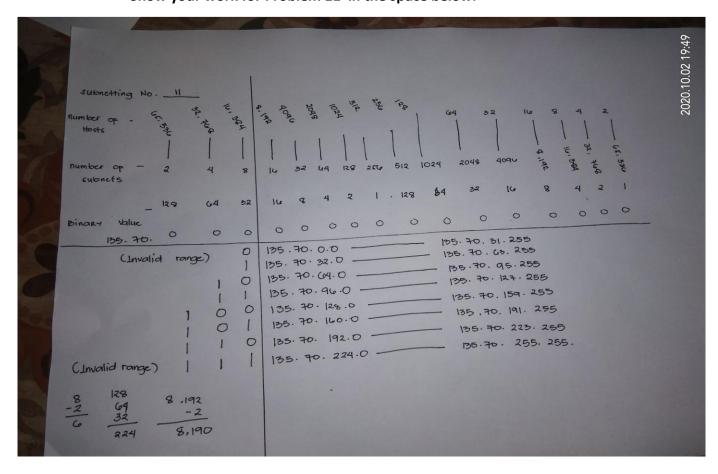|	
Number of needed usable hosts	8,000
Network Address	**135.70.0.0**
Address class	**B**
Default subnet mask	**255.255.0.0**
Custom subnet mask	**255.255.224.0**
Total number of subnets	**8**
Number of usable subnets	**6**
Total number of host addresses	**8,192**
Number of usable addresses	**8,190**
Number of bits borrowed	**3**
What is the 5th usable subnet range?	**135.70.160.0 to 135.70.191.255**
What is the subnet number for the 6th usable subnet?	**135.70.192.0**
What is the subnet broadcast address for the 3rd usable subnet?	**135.70.95.255**
What are the assignable addresses for the 5th usable subnet?	**135.70.128.1 to 135.70.159.254**

Show your work for Problem 11 in the space below.

subnetting No. 11

number of Hosts

65.536   32.768   16.384   8.192   4096   2048   1024   512   256   128   64   32   16   8   4   2

number of subnets   —   2   4   8   16   32   64   128   256   512   1024   2048   4096   8.192   16.684   32.768   65.536

128   64   32   16   8   4   2   1 . 128   64   32   16   8   4   2   1

Binary   value

135. 70.   O   O   O

(Invalid range)

		135.70. 0.0	————	135.70. 31.255
1		135.70. 32.0	————	135.70. 63.255
1	O	135.70. 64.0	————	135.70. 95.255
1	1	135.70. 96.0	————	135.70. 127.255
O	O	135.70. 128.0	————	135.70. 159.255
O	1	135.70. 160.0	————	135.70. 191.255
1	O	135.70. 192.0	————	135.70. 223.255
1	1	135.70. 224.0	————	135.70. 255.255.

(Invalid range)

```
  8     128        8 .192
 -2     64          -2
  6     32
        224        8,190
```

Subnetting

Problem 12

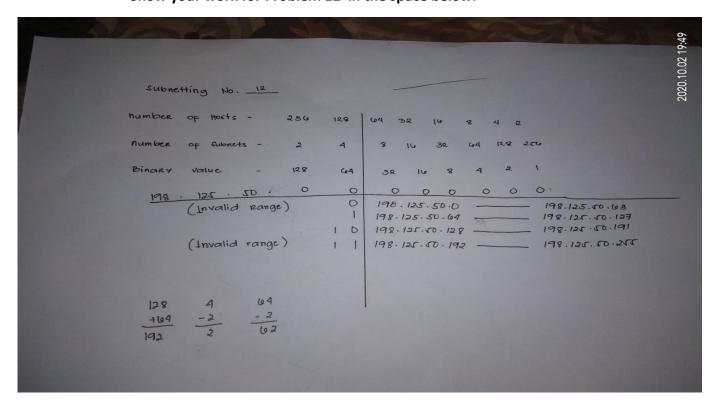|	
Number of needed usable hosts	45
Network Address	**198.125.50.0**
Address class	**C**
Default subnet mask	**255.255.255.0**
Custom subnet mask	**255.255.224.192**
Total number of subnets	**4**
Number of usable subnets	**2**
Total number of host addresses	**64**
Number of usable addresses	**62**
Number of bits borrowed	**2**
What is the 5th usable subnet range?	**198.125.50.64 to 98.125.50.127**
What is the subnet number for the 6th usable subnet?	**198.125.50.64**
What is the subnet broadcast address for the 3rd usable subnet?	**198.125.50.191**
What are the assignable addresses for the 5th usable subnet?	**198.125.50.129 to 198.125.50.190**

Show your work for Problem 12 in the space below.

Subnetting

Problem 13

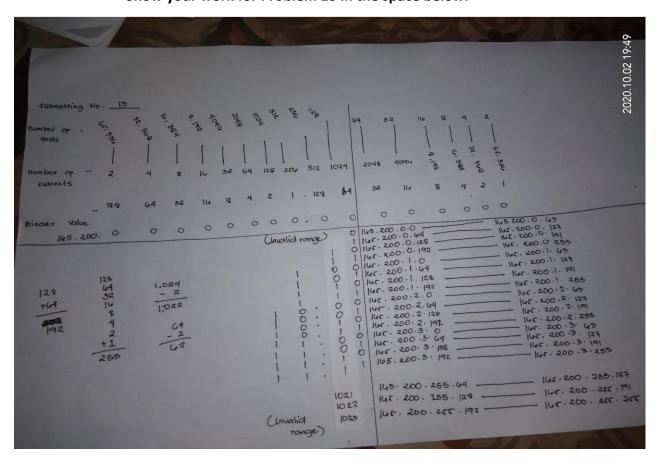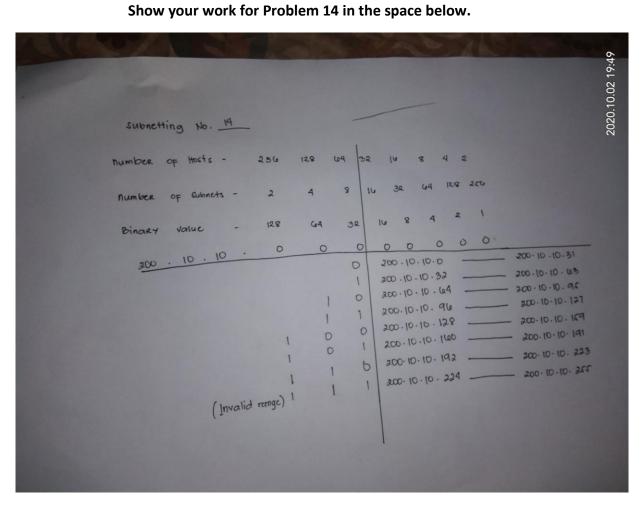|	
Network Address	165.200.0/26
Address class	**B**
Default subnet mask	**255.255.0.0**
Custom subnet mask	**255.255.225.192**
Total number of subnets	**1,024**
Number of usable subnets	**1,022**
Total number of host addresses	**64**
Number of usable addresses	**62**
Number of bits borrowed	**10**
What is the 9th usable subnet range?	**165.200.2.64 to 165.200.2.127**
What is the subnet number for the 10th usable subnet?	**165.200.2.128**
What is the subnet broadcast address for the 1022nd usable subnet?	**165.200.255.191**
What are the assignable addresses for the 1021st usable subnet?	**165.200.255.65 to 165.200.255.126**

Show your work for Problem 13 in the space below.

Subnetting

Problem 14

Number of needed usable hosts	16
Network Address	**200.10.10.0**
Address class	**C**
Default subnet mask	**255.255.255.0**
Custom subnet mask	**255.255.225.224**
Total number of subnets	**8**
Number of usable subnets	**6**
Total number of host addresses	**32**
Number of usable addresses	**30**
Number of bits borrowed	**3**
What is the 6th usable subnet range?	**200.10.10.192 to 200.10.10.223**
What is the subnet number for the 4th usable subnet?	**200.10.10.128**
What is the subnet broadcast address for the 3rd usable subnet?	**200.10.10.127**
What are the assignable addresses for the 5th usable subnet?	**200.10.10.161 to 200.10.10.190**

Show your work for Problem 14 in the space below.

Subnetting

Problem 15

Network Address	**93.0.0.0 \19**
Address class	<u>A</u>
Default subnet mask	<u>**255.0.0.0**</u>
Custom subnet mask	<u>**255.255.224.0**</u>
Total number of subnets	<u>**2,048**</u>
Number of usable subnets	<u>**2,046**</u>
Total number of host addresses	<u>**8,192**</u>
Number of usable addresses	<u>**8,190**</u>
Number of bits borrowed	<u>**11**</u>
What is the 14th usable subnet range?	<u>**93.1.192.0 to 93.1.223.255**</u>
What is the subnet number for the 8th usable subnet?	<u>**93.1.0.0**</u>
What is the subnet broadcast address for the 6th usable subnet?	<u>**93.0.223.255**</u>
What are the assignable addresses for the 11th usable subnet?	<u>**93.1.96.1 to 93.1.127.254**</u>

Show your work for Problem 15 in the space below.