RW354
Principles of Computer Networking

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The material presented in these slides is used with permission from

- *Larry L. Peterson and Bruce S. Davie. Computer Networks: A Systems Approach (Second Edition). Morgan Kaufmann Publishers. ISBN 1-55860-577-0.*
- *William Stallings. Data and Computer Communications (Sixth Edition). Prentice-Hall Inc. ISBN 0-13-571274-2.*
- *Andrew S. Tannenbaum. Computer Networks (Fourth Edition). Prentice Hall Inc. ISBN 0-13-349945-6.*

Question 4 (b)

Consider the IP address 229.1.2.3

229_{10} = 1110 0101 which is a class D (multicast) address.

Question 4(c)

A 19 bit class B subnet mask implies

- *16 bits for the network-id*
- *3 bits for the subnet id: 2^3 = 8 subnets*
- *13 bits for the host-id: 2^3 = 8192 hosts.*

Question 4(d)

Consider the IP address 180.25.21.172

180_{10} = 1011 0101 which is a class B address.

The subnet mask is 255.255.192.0

- *255 & 180 = 180*
- *255 & 25 = 25*
- *192 & 21 = 0*
- *0 & 172 = 0*

The subnet address is 180.25.0.0

Question 4(g)

- *114.34.2.28*
  114_{10} = 0111 0010 which is a class A address.
- *19.34.21.5*
  19_{10} = 0001 0011 which is a class A address
  netid = 19.0.0.0 and hostid = 34.21.5
- *23.67.12.1*
  23_{10} = 0001 0111 which is a class A address
  netid = 23.0.0.0 and hostid = 67.12.1
- *127.23.4.0*
  127_{10} = 0111 0011 which is a class A address
  netid = 127.23.0.0 and hostid = 4.0

Question 4(h)

A class B mask has the format 255.255.X.Y

- *a mask 255.255.128.0 creates 2 subnets*
  128 = 1000 0000
- *a mask 255.255.224.0 creates 8 subnets (5)*
  224 = 1110 0000
- *a mask 255.255.248.0 creates 32 subnets (30)*
  248 = 1111 1000
- *a mask 255.255.252.0 creates 64 subnets (62)*
  252 = 1111 1100
- *a mask 255.255.254.0 creates 128 subnets (120)*
  254 = 1111 1110
- *a mask 255.255.255.0 creates 256 subnets (250)*
  255 = 1111 1111

Question 4(i)

A class B mask has the format 255.255.X.Y

- *a mask 255.255.192.0 creates 4 subnets*
  192 = 1100 0000
- *a mask 255.255.0.0 creates 1 subnet*
- *a mask 255.255.224.0 creates 8 subnets*
  248 = 1110 0000
- *a mask 255.255.255.0 creates 256 subnets*
  255 = 1111 1111

Question 4(j)

- *the mask 255.255.255.0 has /24 bits*
- *the mask 255.0.0.0 has /8 bits*
- *the mask 255.255.224.0 has /19 bits*
  224 = 1110 0000
- *the mask 255.255.240.0 has /20 bits*
  240 = 1111 0000

Question 4(k)

- *123.56.77.32/29 Class A. The hostid range is 123.56.77.32 to 123.56.77.39 ($8 = 2^3$)*
- *200.17.21.128/27 Class C. The hostid range is 200.17.21.128 to 200.17.21.159 ($32 = 2^5$)*
- *17.34.16.0/23 Class A. The hostid range is 17.34.16.0 to 17.34.17.255 ($512 = 2^9$)*
- *180.34.64.64/30 Class B. The hostid range is 180.34.64.64 to 180.34.64.67 ($4 = 2^2$)*