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**Introduction to Computer networks**

**Mid Term Exam**

1. You are required to design a network for class B IP address of 128.0.X.X, in this design you are supposed to have at least one thousand computers in each subnet. (60 marks)

Answer: IP:128.0.x.x

Host request = 1000 🡺 2n - 2 = 1024 from (1000) 🡺 n = 10, Host = 1022, Subnet=64

255.255.1111 1100. 0000 0000 🡺 Subnet = 255.255.252.0 🡺 /22

This IP belong to 128.0.0.0 - 128.0.3.255 range

* 1. What is the maximum number of subnets can you have? Demonstrate how you came up with this number.

Host request = 1000 🡺 2n - 2 = 1024 from (1000) 🡺 n = 10, So number of 0 is 10  
Zero will start from left and rest will fill by 1 up to 16, so we will have 10

Host = 1022, Subnet=64

Count of 1 from whatever is not zero: Subnet=64

* 1. What would be the subnet mask for this network? Demonstrate how you came up with this subnet mask.

Based on above calculation we will have:

255.255.1111 1100. 0000 0000 🡺 Subnet = 255.255.252.0 🡺

8 + 8 + 6 + 0 = 22 🡺 /22

What would be the IP range of subnet 7? Demonstrate how you came up with the range.

We have to find a pattern:

Range 1: 128.0.0.0 - 128.0.3.255 🡸 3 for 255 – 252 = 3 and 255 for 255 – 0 = 255

Range 2: 128.0.4.0 - 128.0.6.255

Range 3: 128.0.7.0 - 128.0.9.255

Range 7: 128.0.19.0 - 128.0.21.255

1. Design physical topology, number of connectivity devices and the security of an office with 100 employees where they use an intranet web site (Local web site) where they access company information. Start from the DEMARC point and end at the computer level. Explain why you used the topology that you used. In your design include wireless internet connection. Explain its setup a well. (40 marks)

Good luck