1. This question examines subnets and subnet masks.

* A particular customer location has been assigned a Class C IP address. Is it possible to support 11 subnets at this location with each subnet supporting 32 end-user machines? (Answer YES or NO and briefly discuss WHY).
* A particular customer location has been assigned a Class C IP address. There will be nine subnets at this customer location. Determine the subnet mask. Determine the maximum number of users per subnet.

ANS.

1. Class C IP addressing has default subnet mask of – 255.255.255.0.   
   Since Class C has first 3 octets reserved for network addresses last octet can be used for subnetting.

If we borrow bit by bit basis the numbers are even for the number of subnets that can be formed in a Class C network.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Network Bits | Subnet Mask | Bits borrowed | Subnets = 2^bitborrowed | Hosts/Subnet= 2^bit-2 |
| 24 | 255.255.255.0 | 0 | 1 | 254 |
| 25 | 255.255.255.128 | 1 | 2 | 126 |
| 26 | 255.255.255.192 | 2 | 4 | 62 |
| 27 | 255.255.255.224 | 3 | 8 | 30 |
| 28 | 255.255.255.240 | 4 | 16 | 14 |
| 29 | 255.255.255.248 | 5 | 32 | 6 |
| 30 | 255.255.255.252 | 6 | 64 | 2 |

Looking at above table **yes a network can have 9 subnets** when 4 bits are borrowed from host octet,   
for no of Subnets addresses of – 16 and   
Host addresses of – 2^4-2 =14

In this case,  
 if the network has 9 subnets i.e. 16-9 = 7 subnet addresses for network will be wasted, and 4 bits are borrowed from host octet

But this setting **will NOT support 32 end user machines**

The maximum host ip addresses are – 14 only so it will have to cater only 14 user machines.

1. Customer location assigned with Class C IP Address   
   9 Subnets at this customer location   
   that means Subnet bits – 4 , host bits -4

Total no of subnets –sine 4 bits are borrowed i.e. 2^4= 16,   
 (9 subnets are already used rest 3 subnets are free & unused / wasted)  
Total no of hosts addresses – 2^4 -2 = 16-2 = 14 addresses

Subnet mask for this location – **255.255.255.240/28** binary --- 11110000

Maximum number of users per subnet – 255.255.255.240 --- 2^4-2= **14**