11.5.5

Questions:

How many host addresses are needed in the largest required subnet?  
50

What is the minimum number of subnets required?  
The requirements stated above specify two company networks plus two additional networks for future expansion. So, the answer is a minimum of four networks.

The network that you are tasked to subnet is 192.168.0.0/24. What is the /24 subnet mask in binary?  
1111111.11111111.11111111.00000000

e. The subnet mask is made up of two portions, the network portion, and the host portion. This is represented in the binary by the ones and the zeros in the subnet mask.

Questions:

In the network mask, what do the ones represent?  
The ones represent the network portion.

In the network mask, what do the zeros represent?  
The zeroes represent the host portion.

1) (/25) 11111111.11111111.11111111.**1**0000000

Dotted decimal subnet mask equivalent:  
255.255.255.128

Number of subnets? Number of hosts?  
Two subnets (2^1) and 128 hosts (2^7) – 2 = 126 hosts per subnet

2) (/26) 11111111.11111111.11111111.**11**000000

Dotted decimal subnet mask equivalent:  
255.255.255.192

Number of subnets? Number of hosts?  
Four subnets (2^2) and 64 hosts (2^6) – 2 = 62 hosts per subnet

3) (/27) 11111111.11111111.11111111.**111**00000

Dotted decimal subnet mask equivalent:  
255.255.255.224

Number of subnets? Number of hosts?  
Eight subnets (2^3) and 32 hosts (2^5) – 2 = 30 hosts per subnet

4) (/28) 11111111.11111111.11111111.**1111**0000

Dotted decimal subnet mask equivalent:  
255.255.255.240

Number of subnets? Number of hosts?  
Sixteen subnets (2^4) and 16 hosts (2^4) – 2 = 14 hosts per subnet

5) (/29) 11111111.11111111.11111111.**11111**000

Dotted decimal subnet mask equivalent:  
255.255.255.248

Number of subnets? Number of hosts?  
Thirty two subnets (2^5) and 8 hosts (2^3) – 2 = 6 hosts per subnet

6) (/30) 11111111.11111111.11111111.**111111**00

Dotted decimal subnet mask equivalent:  
255.255.255.252

Number of subnets? Number of hosts?  
Sixty four subnets (2^6) and 4 hosts (2^2) – 2 = 2 hosts per subnet

Considering your answers above, which subnet masks meet the required number of minimum host addresses?  
/25, /26

Considering your answers above, which subnet masks meets the minimum number of subnets required?  
/26, /27, /28, /29, /30 will give the required number of subnets.

Considering your answers above, which subnet mask meets both the required minimum number of hosts and the minimum number of subnets required?  
/26 will give you the four subnets that are required, and 62 hosts per subnet, which is greater than the 50 hosts required for the first subnet.