Small Office Home Office / SOHO Network Design

PROBLEM:

XYZ company is a fast-growing company in Eastern Australia with more than 2 million customers globally. The company deals with the selling and buying of food items, which are basically operated from the headquarters. The company is intending to open a branch near a local village Bonalbo. Thus, the company requires young IT graduates to design the network for the branch. The network is intended to operate separately from the HQ network.

Being a small network, the company has the following requirements during implementation:

1. One router and one switch to be used (All CISCO products)
2. 3 departments (Admin/IT, Finance\HR and Customer service/Reception)
3. Each department is required to be in different VLANS
4. Each department is required to have wireless networks for users.
5. Host devices in the network are required to obtain IPv4 addresses automatically.
6. Divides in all the departments are required to communicate with each other.

Assume the ISP gave out a base network of 192.168.1.0

BACKGROUND WORK:

Base Network: 192.168.1.0

Number of subnets = 3

No. of subnets =2^n (where n is the borrowed number of subnet bits)

2^n = 3

n = 2 (this will give us more than enough bits)

Class C address provided so subnet should be 255.255.255.0 or
11111111.11111111.11111111.00000000

Since we need to use 2 bits from the last octet our subnet will be
11111111.11111111.11111111.11000000 or 255.255.255.192

New subnet mask = 255.255.255.192

This will have a block size of 64

1st Subnet

Network ID: 192.168.1.0

Broadcast ID: 192.168.1.63

Host range: 192.168.1.1-192.168.1.62

2nd Subnet

Network ID: 192.168.1.64

Broadcast ID: 192.168.1.127

Host range: 192.168.1.65 - 192.168.1.126

3rd Subnet

Network ID: 192.168.1.128

Broadcast ID: 192.168.1.191

Host range: 192.168.1.129 - 192.168.1.190