

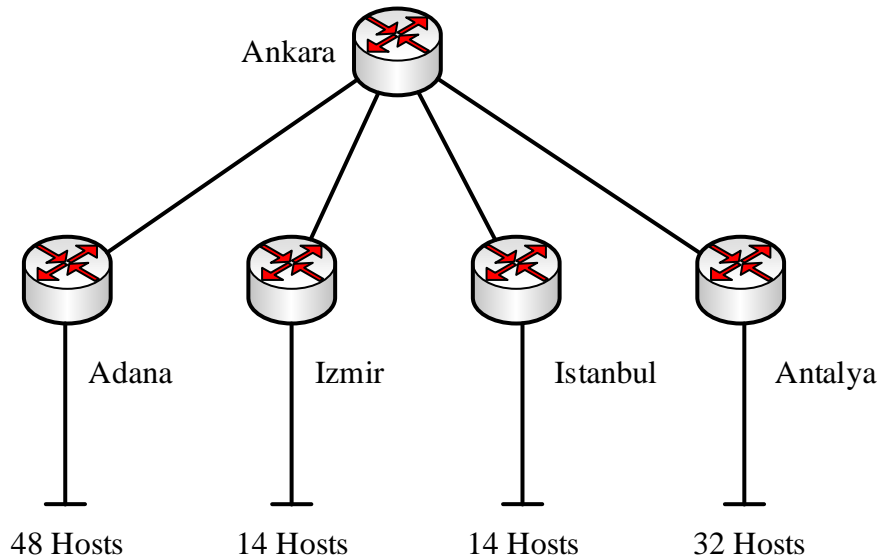


**ÇUKUROVA UNIVERSITY**  
**FACULTY OF ENGINEERING**  
**COMPUTER ENGINEERING DEPARTMENT**

**EXERCISE SHEET 4 – VLSM and TCP Connection Management**

**Task 1**

The IT department of a company has received a class C network with the network address 196.15.1.0 for structuring the network, the requirement profile of which is illustrated in the following figure:



**Note:** Do not use a calculator to solve this problem!

Design an addressing scheme using VLSM (Variable Length Subnet Mask) considering all subnetworks (including router-router connections). Fill out the table below.

**Assumption:** The subnet in which all additional network bits have the bit value 0 can be used.

| Subnet ID         | Subnet address | Address range for stations | Broadcast address |
|-------------------|----------------|----------------------------|-------------------|
| Ankara            |                |                            |                   |
| Adana             |                |                            |                   |
| Izmir             |                |                            |                   |
| Istanbul          |                |                            |                   |
| Antalya           |                |                            |                   |
| Ankara ⇔ Adana    |                |                            |                   |
| Ankara ⇔ Izmir    |                |                            |                   |
| Ankara ⇔ Istanbul |                |                            |                   |
| Ankara ⇔ Antalya  |                |                            |                   |



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**Task 2**

The following message exchange of a connection between an HTTP server and an HTTP client is given:

| Nr. | Data Length | Src. Port | Dst. Port | Seq. Nr. | Ack. Nr. | Flags   |
|-----|-------------|-----------|-----------|----------|----------|---------|
| 1   | 0           | 1000      | 80        | 3459     | 0        | SYN     |
| 2   | 0           | 80        | 1000      | 8656     | 3460     | ACK SYN |
| 3   | 0           | 1000      | 80        | 3460     | 8657     | ACK     |
| 4   | 676         | 1000      | 80        | 3460     | 8657     | ACK PSH |
| 5   | 0           | 80        | 1000      | 8657     | 4136     | ACK     |
| 6   | 247         | 80        | 1000      | 8657     | 4136     | ACK PSH |
| 7   | 0           | 1000      | 80        | 4136     | 8904     | ACK     |
| 8   | 171         | 80        | 1000      | 8904     | 4136     | ACK PSH |
| 9   | 0           | 80        | 1000      | 9075     | 4136     | ACK FIN |
| 10  | 0           | 1000      | 80        | 4136     | 9076     | ACK     |
| 11  | 0           | 1000      | 80        | 4136     | 9076     | ACK FIN |
| 12  | 0           | 80        | 1000      | 9076     | 4137     | ACK     |

Follow the exchange of messages in the table above using the state transition diagram for client and server. Assume that the client and server are initially in the closed state, the server receives the passive OPEN command and the client receives the active OPEN command.

To do this, create a table for the client and server with the columns “Status”, “Input”, “Output”, and “Subsequent Status” (indicate the number of the sent / received message in brackets).