第六次作业：（英文版教材第五章 1，5，7，14，15，16，23，24，25，27，28，
补充题 1-2）

1. Are there any circumstances when connection-oriented service will (or at least should) deliver packets out of order? Explain.

5. Consider the network of Fig. 5-12(a). Distance vector routing is used, and the following vectors have just come in to router C: from B: (5, 0, 8, 12, 6, 2); from D: (16, 12, 6, 0, 9, 10); and from E: (7, 6, 3, 9, 0, 4). The cost of the links from C to B, D, and E, are 6, 3, and 5, respectively. What is C's new routing table? Give both the outgoing line to use and the cost.

7. For hierarchical routing with 4800 routers, what region and cluster sizes should be chosen to minimize the size of the routing table for a three-layer hierarchy? A good starting place is the hypothesis that a solution with k clusters of k regions of k routers is close to optimal, which means that k is about the cube root of 4800 (around 16). Use trial and error to check out combinations where all three parameters are in the general vicinity of 16.

14. A datagram network allows routers to drop packets whenever they need to. The probability of a router discarding a packet is p. Consider the case of a source host connected to the source router, which is connected to the destination router, and then to the destination host. If either of the routers discards a packet, the source host eventually times out and tries again. If both host-router and router-router lines are counted as hops, what is the mean number of
    (a) hops a packet makes per transmission?
    (b) transmissions a packet makes?
    (c) hops required per received packet?

15. Describe two major differences between the ECN method and the RED method of congestion avoidance.

16. Imagine a flow specification that has a maximum packet size of 1000 bytes, a token bucket rate of 10 million bytes/sec, a token bucket size of 1 million bytes, and a maximum transmission rate of 50 million bytes/sec. How long can a burst at maximum speed last?

23. Suppose that instead of using 16 bits for the network part of a class B address originally, 20 bits had been used. How many class B networks would there have been?

24. Convert the IP address whose hexadecimal representation is C22F1582 to dotted decimal notation.

25. A network on the Internet has a subnet mask of 255.255.240.0. What is the maximum number of hosts it can handle?

27. A large number of consecutive IP addresses are available starting at 198.16.0.0. Suppose that four organizations, A, B, C, and D, request 4000, 2000, 4000, and 8000 addresses, respectively, and in that order. For each of these, give the first IP address assigned, the last IP address assigned, and the mask in the w.x.y.z/s notation.

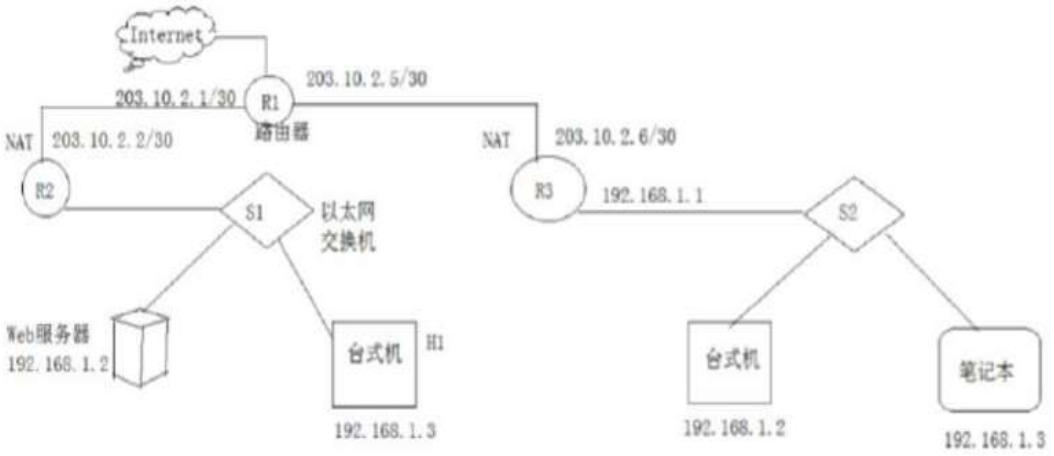
28. A router has just received the following new IP addresses: 57.6.96.0/21, 57.6.104.0/21, 57.6.112.0/21, and 57.6.120.0/21. If all of them use the same outgoing line, can they be aggregated? If so, to what? If not, why not?

补充题 1：

A network 101.200.16.0/20 is divided into 5 subnets, in which all addresses are assigned. For each subnet, give its network address in w.x.y.z/s notation.

补充题 2：

47. 某校园网有两个局域网，通过路由器 R1、R2 和 R3 互联后接入 Internet， S1 和 S2 为以太网交换机，局域网采用静态 IP 地址配置，路由器部分接口以及各主机的 IP 地址如图所示：



假设 NAT 转换表结构为：

外网		内网	
IP 地址	端口号	IP 地址	端口号

请回答下列问题：

(1) 为使 H2 和 H3 能够访问 Web 服务器（使用默认端口号），需要进行什么配置？

(2) 若 H2 主动访问 Web 服务器时，将 HTTP 请求报文封装到 IP 数据报 P 中发送，则 H2 发送 P 的源 IP 地址和目的 IP 地址分别是？经过 R3 转发后，P 的源 IP 地址和目的 IP 地址分别是？经过 R2 转发后，P 的源 IP 地址和目的 IP 地址分别是？