

## 博班資格考 資訊網路試題

命題方式: close book (100/02/15)

考試時間: 共 4 小時

### 一、簡答題(30 分)：每題 2 分

1. What three things about message exchanges do network standards govern?
2. Why are routers called Layer 3 devices?
3. Do LANs normally use multimode fiber or single-mode fiber?
4. Does Ethernet have multiple MAC layer standards?
5. What is the first issue to consider in switch purchases?
6. What is the relationship between handoffs and roaming in WLANs?
7. The 802.11 standard has two mechanisms for media access control. Which one is mandatory and is normally used?
8. What are the two technologies for remote access point management?
9. What are the two major protocols for VoIP signaling?
10. Do WiMAX carriers primarily use licensed or unlicensed bands?
11. What device must a company have to connect a router to a leased line?
12. What are the two ways that companies can get IP WAN service?
13. What specifies a particular application on a particular host in TCP/IP?
14. Distinguish between authentication and authorization.
15. What is what-if analysis in network simulation?

### 二、問答題(20 分)：每題 5 分

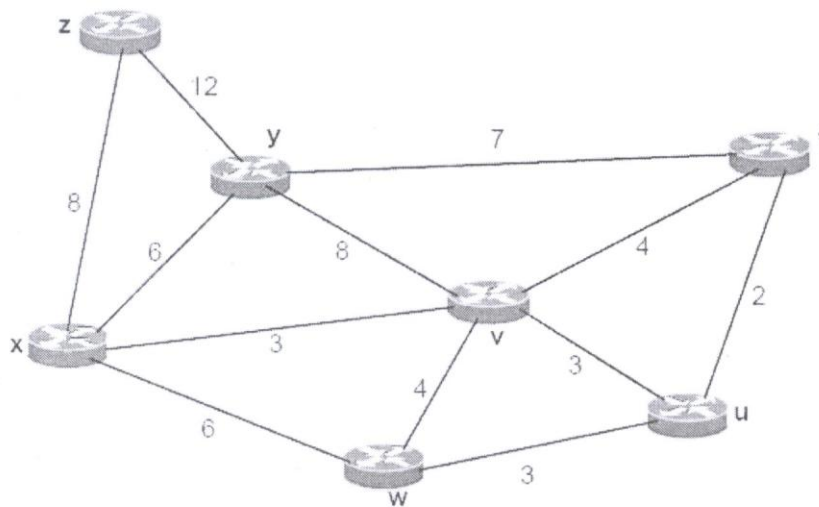
1. Create a table comparing Firewalls, Intrusion Detection Systems (IDSs), and Intrusion Prevention Systems (IPSs).
2. How does a router use the routing table to make the routing decision?
3. What is the final frame if SMTP (an e-mail protocol that requires TCP and IP) is used at the application layer and if Frame Relay (which has a header and a trailer) is used at the data link layer?
4. Compare the speeds and the distance limits of 802.11, Bluetooth, and UWB.

三、綜合問答題(50分)：每題10分

1. Fill in the blank:

Application	Application layer protocol	Underlying transport protocol
e-mail	_____ A _____	_____ F _____
remote terminal access	_____ B _____	_____ G _____
Web	HTTP	_____ H _____
file transfer	_____ C _____	TCP
streaming multimedia	_____ D _____	_____ I _____
Internet telephony	_____ E _____	_____ J _____

- Please state the differences between three major mechanisms in TCP congestion control which are AIMD, slow start and conservative after timeout events.
- Suppose hosts A and B are separated by 10,000km and connected by a direct link of  $R=1$  Mbps. Suppose the propagation speed over the link is  $2.5 \times 10^8$  m/sec. How long does it take to send a 400K bits file? Suppose the file is broken up to 4 packets and each packet is ACKed by the receiver and the transmission time is negligible. Assume sender cannot send a packet until the preceding one is ACKed. How long does it take to send the file?
- Consider the following network. With the indicate link costs, use Dijkstra's shortest path algorithm to compute the shortest path from x to all nodes. Show how the algorithm works by computing tables.



5. Consider three LANs interconnected by two routers, as shown in the diagram below.
- Redraw the diagram to include adapters.
  - Assign IP addresses to all of the interfaces. For Subnet 1 use addresses of the form 111.111.111.xxx; for Subnet 2 uses addresses of the form 122.222.222.xxx; and for Subnet 3 use addresses of the form 133.133.133.xxx.
  - Assign MAC addresses to all of the adapters.
  - Consider sending an IP datagram from Host A to Host F. Suppose all of the ARP tables are up to date. Enumerate all the steps as done for the single router example.
  - Repeat (d), now assuming that the ARP table in the sending host is empty (and the other tables are up to date).

