國立雲林科技大學資訊管理系
107 學年度第 1 學期博士班資格考
科目：資訊網路
時間：4 小時 (Closed book)
作答時，請注意各題之比例配分，並清楚標示題號

第一部分：40 分(共 4 題，每題 10 分，全部需作答)

1. Comparison of the typical features of popular interconnection devices.

	Hubs	Routers	Switches
Traffic isolation			
Plug and play			
Optimal routing			

2. Streaming video systems can be classified into three categories. Name and briefly describe each of these categories.

3. The Internet-Standard Management Framework consists of four parts. Name and briefly describe each of these parts.

4. True or false?
   a. A user requests a Web page that consists of some text and three images. For this page, the client will send one request message and receive four response messages.
   b. Two distinct Web pages (for example, www.mit.edu/research.html and www.mit.edu/students.html) can be sent over the same persistent connection.
   c. With nonpersistent connections between browser and origin server, it is possible for a single TCP segment to carry two distinct HTTP request messages.
   d. The Date: header in the HTTP response message indicates when the object in the response was last modified.
   e. HTTP response messages never have an empty message body.

第二部分：60 分(5 題選 4 題，每題 15 分)

1. Suppose Host A wants to send a large file to Host B. The path from Host A to Host B has three links, of rates R1 = 500 kbps, R2 = 1 Mbps, and R3 = 2 Mbps.
   a. Assuming no other traffic in the network, what is the throughput for the file transfer?
   b. Suppose the file is 4 million bytes. Dividing the file size by the throughput, roughly how long will it take to transfer the file to Host B?

2. We have said that an application may choose UDP for a transport protocol because UDP offers finer application control (than TCP) of what data is sent in a segment and when.
   a. Why does an application have more control of what data is sent in a segment?
   b. Why does an application have more control on when the segment is sent?

3. What does it mean for a wireless network to be operating in“infrastructure mode”?

   If the network is not in infrastructure mode, what mode of operation is it in, and what is the difference between that mode of operation and infrastructure mode?

4. Answer the following questions:
   a. From a service perspective, what is an important difference between a symmetric-key system and a public-key system?
   b. Suppose n = 10,000, a = 10,032, and b = 10,008. Use an identity of modular arithmetic to calculate in your head (a • b) mod n.

5. Consider the network below.
   a. Suppose that this network is a datagram network. Show the forwarding table in router A, such that all traffic destined to host H3 is forwarded through interface 3.
   b. Now suppose that this network is a virtual circuit network and that there is one ongoing call between H1 and H3, and another ongoing call between H2 and H3. Write down a forwarding table in router A, such that all traffic from H1 destined to host H3 is forwarded through interface 3, while all traffic from H2 destined to host H3 is forwarded through interface 4.