

# 國立臺北科技大學一百零九學年第二學期

## 電機系博士班資格考試試題範本說明

- 一. 本系博士班資格考試試題為 A4 格式之版面。
- 二. 提供之試題範本自第 1 頁起提供 A4 格式之版面共 4 頁，若有不足請自行加頁。
- 三. 本範本以 Office 之 Word 文書應用軟體製作，命題委員至少須輸入之資料共四項，各項簡要說明如下：(前三項請依範本上之原字型與字型大小輸入，**前二項已代為執行合併列印套稿，請確認組別名稱與考試科目**。謝謝您！)

(一) **【考試科目名稱】** ⇒ [依所附檔案內**考試科目名稱**完整輸入取代]

(二) ⇒ [請依試題**題數**輸入取代並增加**必要之配分**與**各項特殊規定**]

### 注意事項：

1. 本試題共**【7】**題，配分共 100 分。
2. 請按順序標明題號作答，不必抄題。
3. 全部答案均須答在試卷答案欄內，否則不予計分。
4. 考試時間:二小時。

(三)

**試題本文** ⇒ [請輸入**題號**與**試題內容**並完成排版與列印]

### 範本版面說明

試題本文之外方格線，係以單格表格並以隱藏格線方式設計，請在格線內命題，不要超出格線外；若有圖片，亦請於列印後黏貼於規劃版面內。謝謝！

- 四. 命題版面達 A4 共 2 頁(含)以上時，請修改範本第 1 頁之 **第一頁 共一頁** 為 **第一頁 共二頁**；若頁數更多，請類推修改增加之。
- 五. 本範本檔案及考試科目名稱檔案，將由本系以隨身碟提供命題委員，請命題委員在規劃版面內命題，**並以 A4 紙張列印出試題繳交，隨身碟亦請交給本系**。本系將直接列印後隨即製版，不再作其他處理，若有圖片請自行黏貼於妥當之版面位置。

# 國立臺北科技大學

一百零九學年第二學期電機系博士班資格考試

## 網際網路工程 試題

第一頁 共三頁

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### 注意事項：

1. 本試題共【7】題，配分共 100 分。
2. 請按順序標明題號作答，不必抄題。
3. 全部答案均須答在試卷答案欄內，否則不予計分。
4. 考試時間：二小時。

1. (15 points) HTTP1.1 introduced multiple, pipelined GETs over single TCP connection. The server responds *in-order* (FCFS: first-come-first-served scheduling) to GET requests. What are the disadvantages of the server's FIFO scheduling method in responding to GET requests. Therefore, IETF proposed a solution to this problem in HTTP2.0, please explain how HTTP2.0 can solve this problem.
2. (15 points) Suppose the host *ee.ntut.edu.tw* desires the IP address of *lads.ee.mit.edu*. Also suppose that NTUT's local DNS server is called *dns.ntut.edu.tw* and that an authoritative DNS server for *lads.ee.mit.edu* is called *dns.mit.edu*. And assume that the RTT between a client and the local DNS server is  $RTT_l$ , while the RTT between the local DNS server and other DNS servers is  $RTT_r$ .
  - (a) Please describe the interaction of the various DNS servers using recursive query scenario.
  - (b) Assume that no DNS server performing caching. What is the total response time for using recursive query scenario.

3. (15 points) Suppose that the three measured SampleRTT values are 100 ms, 80 ms, and 130 samples were obtained. Compute the EstimatedRTT after each of these SampleRTT value is obtained, using a value of  $\alpha=0.125$  and assuming that the value of EstimatedRTT was 100 ms just before the first of these three samples were obtained. Compute also the DevRTT after each sample is obtained, assuming a value of  $\beta=0.25$  and assuming the value of DevRTT was 10 ms just before the first of these three samples were obtained. Last, compute the TCP TimeoutInterval after each of these samples is obtained.
  
4. (15 points) Consider the unreliable channel with bit errors and happens the ACK corrupted. Please apply finite state machine to describe the proposed NAK-free protocol for RDT in Figure 1.

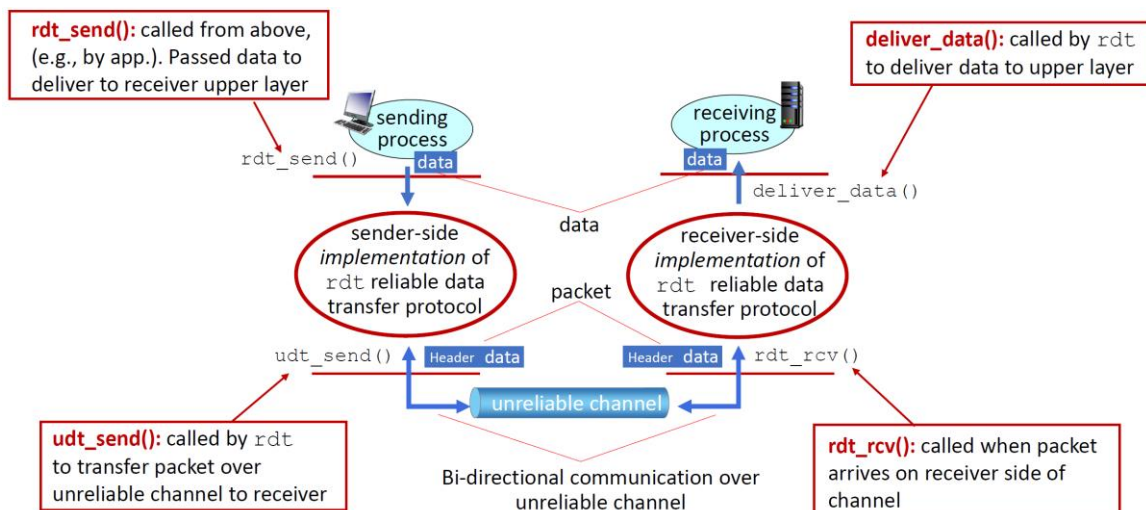


Figure 1

5. (15 points) Suppose you walk into a room, connect to Ethernet, and want to download a Web page. What are all the protocol steps that take place, starting from powering on your laptop to getting the Web page. Assume there is nothing in our DNS or browser caches in your laptop. Explicitly indicate in your steps how you obtain the IP and MAC addresses of a gateway router.
  
6. (10 points) Explain how the Adaptive Retransmission Timeout Interval is calculated in TCP.

7. (15 points) Figure 2 shows the schematic diagram of the distance vector algorithm that b receives DVs from a, c, e. Please list the calculation process of b and the modified DV in b.

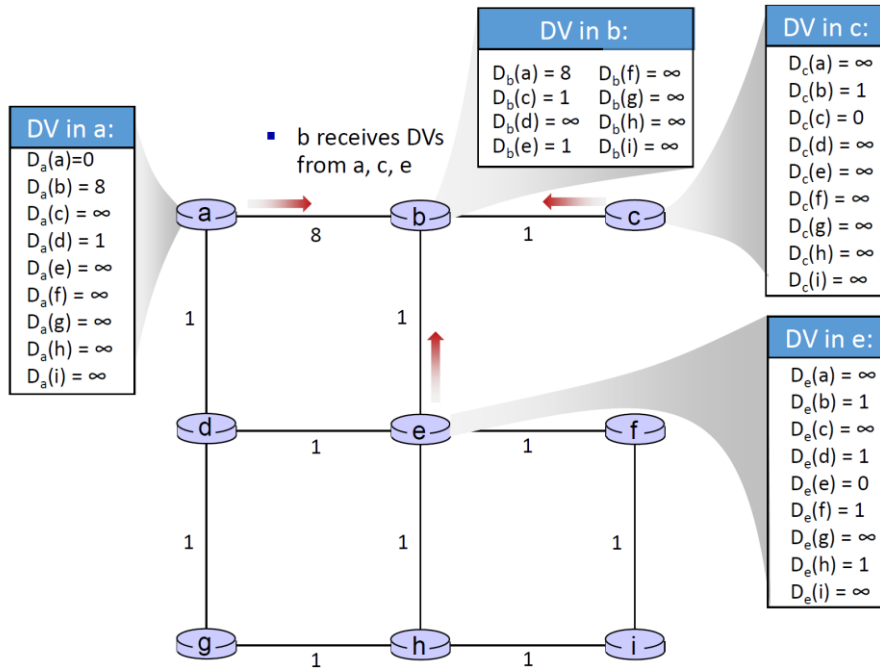


Figure 2