

資訊網路與多媒體研究所

資格考試科目：高等計算機網路

2017/3/9

1. (15%) What is traffic intensity? Please elaborate on the relationship between the traffic intensity and average queuing delay?
2. Wireless Channel:
 - a. (5%) What are the differences between the following types of wireless channel impairments: path loss, multipath propagation, interference from other sources?
 - b. (10%) As a mobile node gets farther and farther away from a base station, why does the base station increase the transmission power and reduce the transmission rate? Please justify your answer based on the relationship among SNR, BER and PHY.
3. (20%) How should the Internet evolve to better support multimedia? Please elaborate on the three kinds of the solution philosophy, i.e., (i) integrated services philosophy, (ii) differentiated services philosophy, and (iii) laissez-faire.
4. (20%) Message Confidentiality, Message Integrity and Endpoint Authentication.
 - a. Why do we need “message integrity” and “endpoint authentication” if we already have “message confidentiality”?
 - b. What is “Digital Signature”? Why do we need certification authorities for “Digital Signature”?
5. (10%) Please elaborate on the operations of CSMA/CA for IEEE 802.11.
6. CDN (Content Distribution Network) and IP Anycast
 - a. (5%) Why we need CDN for accessing video? How it works?
 - b. (5%) IP Anycast can be used to match clients with CDN servers. Please describe the idea and give a simple example to describe its operation.
7. Suppose Host A sends two TCP segments back to back to Host B over a TCP connection. The first segment has sequence number 87; the second has sequence number 112.
 - a. (5%) How much data is in the first segment?
 - b. (5%) Suppose that the first segment is lost but the second segment arrives at B. In the acknowledgment that Host B sends to Host A, what will be the acknowledgment number?