

1. (10%) 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. (10%) 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. CDN (Content Distribution Network) and IP Anycast
  - a. (10%) 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.
5. (15%) Please describe “Confidentiality”, “Authentication”, “Message Integrity”, and “Access and Availability” for network security.
6. (10%) Please compare the public-key and symmetric-key cryptography.
7. (10%) How to conduct “ciphertext-only attack”, “known-plaintext attack”, and “chosen-plaintext attack”.
8. (15%) By using the following example, please describe how Web caching can significantly reduce the delay in receiving a requested object with low-cost installation.

