

1. Wireless Channel:
  - a. (10%) 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.
2. (10%) Please describe and compare two approaches to handle mobility by respectively router and end system.
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. (10%) Please compare the public-key and symmetric-key cryptography.