

Examination 1 covers the material of Topics 1, 2, 3, and 4 of the course outline.

Please review the assigned readings from the textbook along with the corresponding lecture notes and audio lectures as well as the assigned review questions and homework problems. Make sure that you understand the terminology and concepts introduced on each page of the lecture notes and can explain them in 1-3 sentences. The same is true for the meaning and use of all the fields of IP, IGMP, Mobile IP, TCP, UDP, and RTP PDUs.

The format of the exam will be problems and definitions similar in style and complexity to the assigned review questions and homework problems.

There will be six problems on the exam covering the following areas:

1. Topic 1 and Topic 2 terminology and concepts:

- Communications Networks
- Switching Methods
- Virtual Circuits, Datagrams
- Communications Protocols
- Protocol Functions and Primitives
- TCP/IP Protocol Architecture
- OSI Reference Model
- Application Protocols

2. Topic 3 and Topic 4 terminology and concepts:

- Internetworking Requirements
- IP Approach
- IP Addressing
- IP Routing
- Autonomous Systems
- IP, IPv6, ICMP, ICMPv6, ARP
- TCP Connection Mechanisms
- TCP Flow Control Mechanisms
- TCP Primitives
- TCP Implementation Policies
- TCP ECN Operation

3. IP Protocol:

- Terminology
- Functionality
- Datagram Format
- Functionality of each Header Field

4. Multicasting and Mobile IP

- Terminology
- Functionality
- IGMP Message Formats
- IGMP Operation (Joining, keeping Lists Valid, Leaving)
- Mobile IP Message Formats
- Mobile IP Encapsulation: IP-within-IP Encapsulation, Minimal Encapsulation
- Mobile IP Operation

5. TCP Protocol:

- Connection and Data Flow problem (e.g., lecture notes pages 42-44)
- Specify all TCP segments with appropriate header field values in a complete bi-directional TCP client-server exchange

6. UDP, RTP, RTCP:

- Terminology
- Functionality
- Header Formats
- Functionality of each Header Field
- Protocol Mechanisms