

Ph.D. Qualifying Exam: Computer Networks (January, 2015)
Department of Computer Science and Engineering,
National Sun Yat-Sen University

1. (a) What is a domain name system (DNS)? (2%)
(b) What are the six types of resource records used in describing a domain name? (6%)
(c) Please list two popular Internet mail protocols. (2%)
2. Explain the response status codes of the HTTP protocol: 1xx, 2xx, 3xx, 4xx, and 5xx. (10%)
3. (a) Please explain the four services provided by the transport layer. (8%)
(b) What is the purpose of Internet socket? (2%)
4. (a) What are the five tuples to uniquely define a socket? (5%)
(b) What are the five states defined in TCP Reno? (5%)
5. Please give the address ranges of the five classes (A~E) in IPv4. (10%)
6. Please explain the purposes of the following protocols: NAT, DHCP, ARP, ICMP, IGMP. (10%)
7. Please give two reasons why checksum is used in higher-layer protocols (e.g., TCP, UDP, and IP) while CRC is usually used in the link-layer protocols? (10%)
8. Please draw the generic IEEE 802.11 frame format. You have to indicate the number of bytes in each field. (10%)
9. (a) What is the Fourier analysis for compound signals? (2%)
(b) Given bandwidth B , capacity C , the number of voltage level M , and signal-to-noise ratio SNR , please list both Nyquist's bandwidth equation and Shannon's capacity formula. (4%)
(c) What is spreading spectrum? (2%)
(d) What are the two spreading spectrum schemes? You have to give their full names. (2%)
10. (a) What is the difference between FDM and TDM? (4%)
(b) Please explain the three types of slow fading. (6%)