考试范围。

题型与范围：

选择题：15 x 2 = 30 分（15题，每题2分）

填空题：10 \* 1 = 10 分（15个空格，每个空格1分）

判断题：10 \* 1 = 10 分（10题，每题1分）

简答题：4 \* 5 = 20分 (4题，每题5分)

综合题：3 \* 10 = 30分(3题，每题10分)

试题需要A卷与B卷，原则上A与B卷在题目上必须有60%的不同。

* 选择题，填空题，判断题考点：

1. Access network/Enterprise: Ethernet and WIFI的特点 Page 16
2. End-to-end delays （四种类型，queue delay的不确定性）Page 35
3. Packet loss （主要原因，路由器缓存有限）page 41
4. End-to-end throughput （吞吐量瓶颈）Page 44
5. Encapsulation (app message, segment, datagram, frame等封装与解封装概念) Page 53
6. Client-Server model and P2P model（特征）page 88
7. Common APPs (File transfer, Email, Web, … ) and it underlying transport services (in terms of Data Loss, Throughput and Timing)（loss-tolerant/ bandwidth-sensitive/ Time-Sensitive） （主要应用对数据传输服务的基本要求，从data loss， 吞吐量和延迟/时间）Page 93
8. Common APPs (File transfer, Email, Web, … ) and TCP or UDP (主要应用类型与TCP，UDP的关系)
9. Web page/Object/URL （概念）page 99
10. HTTP request/response, Pull model for retrieving objects page 99 and 124
11. HTTP and stateless protocol/ (non-) Persistent/ HTTP method (GET, POST, HEAD, PUT, and DELETE)/status codes (200 OK, 404Ｎｏｔ　Ｆｏｕｎｄ, 500ＨＴＴＰ　Ｖｅｒｓｉｏｎ　Ｎｏｔ　Ｓｕｐｐｏｒｔ等常见错误)
12. FTP: control and data connection（概念）page 117
13. Email：SMTP (push model for sending mails) and Mail Access Protocols (POP3, IMAP and HTTP, pull model to retrieving mails) （概念）page 125
14. Scalability of P2P Architectures in file distribution (概念) page 145
15. Logical communication channel at transport layer (端到端逻辑链路的概念) page 186
16. Socket addressing，and {connectionless and connection-oriented}Multiplexing and Demultiplexing at transport layer （概念）page 191
17. Checksum and UDP (概念) page 202
18. Stop and wait and Pipelining/sliding-window （概念）page 215
19. Go-Back-N and Selective Repeat: cumulative acknowledgment (概念) page 222 and 224
20. Maximum segment size (MSS) and Maximum transmission unit (MTU) (概念) page 233
21. TCP segment structure {RST, SYN, FIN } and TCP connection management: three-way handshake (概念) page 234
22. Header length of TCP segment without options (概念) page 234
23. TCP Flow control and congestion control （概念区分）
24. Router: Forwarding/Routing and Forwarding table and routing algorithm （概念与关系） page 308
25. Best-effort service model (概念) page 311
26. Forwarding with longest prefix matching rule (概念) page 318
27. IP datagram format (version, TTL, Header checksum) page 333
28. DHCP (概念，功能) page 345
29. ICMP (概念，功能) page 353
30. IPv6 (128bits address space, 40-byte fixed-length header) 等概念
31. Routing algorithm: global and decentralized routing algorithms (概念与区别) page 365
32. Intra Routing in the Internet: RIP/DV-based and OSPF/LS-based page 384 and 388
33. Inter-AS Routing: BGP (AS-PATH and Routing policy) (概念，原理) page 390
34. Link-layer services: *Framing, L*ink access, Reliable delivery, and Error detection and correction (概念) page 436
35. medium access control (MAC) protocol/multiple access protocols/channel partitioning protocols, random access protocols, and taking-turns protocols (概念，特点) page 447
36. MAC Addresses and ARP (概念，功能) page 462
37. Ethernet: repeater，hub, switch (概念，功能) page 470
38. Ethernet Frame Structure (MAC address 48 bits) (概念) page 471
39. Link-Layer Switches: Forwarding and Filtering/self-learning/plug-and-play (概念，原理) page 476 and 479
40. Properties of Link-Layer Switching (Elimination of collisions, Heterogeneous links and Management.) (概念，原理) page 479
41. Switches and routers (概念，原理与区别) page 480

* 简答题考点：

1. Circuit switching and Packet switching (基本原理与特点，差异) Page 22 and 27 (A卷)

电路交换：发送信息前建立连接，预留了恒定贷款，确保恒定速率交付

分组交换：简单有效成本低，不是实时服务

1. Internet: network edge/access network/ network core/network of routers/ network of networks (Hierarchy，ISP等，对整个Internet架构的整体认识) page 32 (B卷)
2. TCP/IP and ISO OSI model Protocol layers/stacks and service models (分层架构，各个层次的基本功能,依赖下层服务，为上层提供服务的思想) Page 47 (A卷)
3. Web Caching/Proxy Server and Conditional GET/Local caching. （原理，计算分析） Page 111 and 114 (B卷)
4. DNS systems（层次结构，基本功能与查询过程: Iterative and Recursive，负载均衡）（A卷）
5. Principles of reliable data transfer (mechanisms: checksum, timer/timeout, sequence number, acknowledgement, pipelining) (基本原理) page 230 (B卷)
6. Router: Where Does Queueing Occur? And why? (原理) page 327 (A卷)
7. IP Datagram Fragmentation in IPv4 and IPv6 (计算题,原理题), page 335 and 358 (B卷)
8. Hierarchical Routing： Intra-AS/Inter-AS routing and hot-potato routing. (原理，功能) page 379 (A卷)
9. Cyclic Redundancy Check (CRC) （原理与计算）page 443 (B卷)
10. CSMA with collision detection (CSMA/CD) （原理）page 456 (A卷)
11. Link-Layer Switches：Self-Learning for building switch table (B卷)

* 综合题考点：

1. TCP Sequence Numbers and Acknowledgment Numbers (计算题，原理题) page 235 (A卷)
2. TCP congestion-control algorithm （TCP Tahoe and Reno）{slow start，Congestion Avoidance，Fast Recovery} (计算题，原理题) page 276 (B卷)
3. IPv4 CIDR addressing and subneting (计算题，原理题) page 338 (A卷)
4. Network Address Translation and Private Network (NAT) (原理题) page 349 (B卷)
5. Link-State Algorithm (计算题，原理题) page 367 (A卷)
6. Distance-Vector Algorithm (计算题，原理题) page 371 (B卷)
7. Sending a IP Datagram off the Subnet (原理题) page 468 (A/B卷)